No. 32.

Field Book

of

W. L. Jepson.

If lost finder please return to W. L. Jepson, Department of Botany, University of California, Berkeley, California, and receive reward. It is valuable only to the owner.

University of California
— 1916 —

Berkeley

Drawings - Record of.

- Eurotia lanata, Barstow, Jepson 4280 8 June 1912. x 1½
- Atriplex lentiformis, Chemehuevis valley, ariz., Colorado River W.L. Jepson 5197. x 1½
- Spirostachys occidentalis. with preced. Jepson 5199. x 1½
- Atriplex fruticulosa. Type spm. Little Oak. Solano Co. Jepson x 5
- Atriplex parryi Jepson 5145. x 5 Lone Pine.
- Atriplex polycarpa Jepson 5215 Mellen, Ariz. x 5.
- Atriplex hymenlytra. x 5. Split mt. Colo Desert, Brandegee, Apr. 1905.
- Atriplex cordulata, type spms Little Oak, Solano Co., Jepson x 5
- Atriplex lentiformis. Chemehuevis valley, Ariz., Jepson 5197. x 1½
- Sarcobatus vermiculatus ♂ & ♀ C F Baker 926 Grand

Junction, Colo. X 1½. Fruit = X 5
Purpus 5854
Fish Lake Val. Nev.

– Calycanthus occidentalis
Vaca Mts., Jepson 5166 X 1½

– Chorizanthe corrugata #5507 X10
" brevicornu X10 #5377, Barstow
thurberi X10 Jepson, Kramer
" membranacea X10 Jepson*
" leptoceras Parish X10
" nortoni X10 R.B. Burro Trail
Santa Lucia Mts.

– Eriogonum gracillimum #5322
invol = X10 calyx = X20
" — angulosum var. maculatum (#5323)
invol = X10 calyx = X20
" — thomasii #5510
" – deflexum. Riverside Mts #5235
calyx. X20 invol. X10
" – nidularium. Victor. #5620
" – nudum, habit X½ Berkeley
Jepson
" vimineum. no. 2976
invol. X10
" umbellatum X½ Horseshoe
Bend.
" nudum. Berkeley Jepson #5686
habit = X ½ fl. = X 20.
" ovalifolium. Longbridge
calyx = Ameeds. X20

– Atriplex leucophylla. X5. Pacific
Grove, Aug. 1896.

– Atriplex confertifolia. X5 fruit. Bishop
1909 Miss Bigelow

– Oxytheca parishii San B. Mts, Parish
Bros. 943 X10

* = Collins Camp. 12 June '93.

– Grayia spinosa. Hall 7264, at Bishop.
X 5

– Suaeda californica. Alameda.
Female fl. X Jepson, habit, X1½
5681.

– Salicornia ambigua X1½
Jepson 5680, Alameda.

– Eriogonum thurberi. Branch X1½
Calyx = X 20. Palm Canon
Wt. J. 1401.

– Eriogonum ovalifolium. var. nivale
Jepson
plant = X1½ calyx = X20.

– Atriplex elegans (fasciculata). Borego
Spr. Colo. Des. Brandegee. Fruit X5.

– Atriplex canescens. Jepson 5225.
Fruit = X 5.

– Chorizanthe pungens. X10. Jepson
Invol. Pac. Grove, Aug. 1896

Berkeley

— Folk-Names of Plants. Real folk names are not desirable cognomens for ever popular use but the demand for common names of our most common plants has been so great, so insistent rather, that I myself have coined or invented a number to meet this demand. Such were as far as possible based on folk lore or folk incidents or discoveries, in great part.

Chaparral Lily.
Fawn Lily.
Blue Dicks.
Grass Nut
Stink Bells.
Nigger-Babies.
Flat-top.
Alkali Blite
Windmill Pink.
Red maids
Kisses.
Steer's Head.
Jackass Clover
Stink-weed.
Fringe-cups.
Hard-Tack.
Rea Chaparral.
White-tip Clover.
Pin-point Clover
Witch's Teeth.
Leather Root.
Red-Berry.
Deer Brush
Blue Blossom
Jim Brush
Buck Brush.
Nahala Mats.
Alkali Mallow.
Tunnel Bush
Alkali-Heath.
Painted Lady
Golden Eggs.
Coyote-Thistle.
Button-Thistle.
Blue-Thistle.
Coast Eryngo.
Gamble-weed.
Dobie Sanicle.
Turkey-Rea
Bladder-Parsnip.
Alkali Parsnip.
Bear Brush.
Creek Dogwood
Buckthorn-Weed.
Creeping Sage.
Crimson Sage.
Pitcher Sage
Tule-Mint.
Coyote-Mint.
Blue Witch.
Tobacco Nimulus
Wallow-Hyssop.
Johnny-Nip.
Johnny-Tuck.
Creek Senecio.
Beach Layia
Mule-Ears.

Above taken from Fl. W. Mud. Cal., includ. MS. notes of desk copy.

Letters from Mrs. G.H. Grant in the Sierras of Tuolumne Co. — "When I left Vacaville all the years I "existed" up here, when I might just as well have been "living", had I had any work in Botany earlier in life. I just felt that I must go into the highways and byways and teach all men, women and children of the wonderful things around them. I like missionary work, Chief, when it is botanical missionary work. Truly neither of us had any idea of the wonderful life you were opening up to me when you let me take the advanced work in Botany only a little over a year ago. What a very happy time it has been since!"

— This is only a sample of the acknowledgment of a student. I have had students say to me, "Why, Professor Jepson, I never saw a tree before I came to you". Such expressions of obligations are a great reward to a working botanist. — Oct. 28, 1915.

— Rattan, Valney, Sketch of his life. With Hall, H.M. in litt. July 16, 1915.

Berkeley

— Dear Miss Bourn. — The Desert Holly belongs to the Saltbush Family. It is a rather remarkable and truly interesting species. It flowers in midwinter. This year I found it in full flower on the shirts of Lead Mt. in the heart of the Mohave Desert near the Cadiz Range. The male and female plants are quite distinct. The flowers are borne in very small roundish clusters, the female greenish, the male yellowish, but the male clusters, in the bud, in December are reddish and look like minute red berries. When these buds come into flower the high coloration is lost. The female flowers grow rose by early summer to a winged fruit.

The dense silvery scurf on the leaves is designed to prevent an excessive loss of water from

the tissues. The plant is well-designed for its habitat. At Christmas we found a broad band of it running along the desert hills near the Walhorn Mine, its boundaries sharply defined by the change in geological formation. There was no age studies of the species but fifty years is probably not too great a figure for the older plants.

It is a most usual thing for leaves of a plant in texture and shape to simulate those of a widely unrelated species. This is because the two species are striving to meet similar conditions. — W.L.J. May 6/16

See her letter in 1916 file.

— Greene, E.L. See S.B. Parish in litt. Apr. 21, 1915.

Memoir in Midland Naturalist, 4: 228a (Nov. 1915).

Wind – Official U.S. Weather Bureau reports of the great storm in northern California make note of maximum wind velocity of 75 miles per hour at Pt. Reyes from the south; and of 40 miles at San Francisco and Sacramento from the Southeast. – Jan. 2-3, '16.

– Friday, Jan. 16, it was cloudy all over in the morning and before noon began to rain softly, continuing all the afternoon. This is not like an ordinary rainstorm in the desert, with blue sky showing, or showing at intervals, off on the horizon, but with "clouds close all around and raining in the middle" as Mrs. Manson expressed it.

– Jan. 17. It rained all night, steadily and very heavily, and this morning until about 9 o'clock. The whole region about the ranch

except on the mesa is very soft, the fine soft soil making a quick mud. At 9.30 word was received by telephone from Victorville that "the river was coming down", had flooded the cement-plant, and was rising one inch per minute. Warnings are being sent out to the ranchers up the river from Barstow whose places lie directly in the way of the flood. This ranch is well protected by the railway embankment. Miss Waterman says this is the longest continuous rain she has ever known on the desert, in the 5½ years spent here.

The flood of the river did not reach Barstow until about eleven o'clock at night. The roar of the advancing wave could be heard for a considerable distance (cont. p. 20)

Birds about Barstow.

No. 1. Zonotrichia leucophrys gambeli. Intermediate sparrow.

Very common. Male: Dove-colored breast and under parts without spots. Back much like female. Dark reddish brown low crest to head.

Female.- light-colored breast mottled with dark spots. Whitish band above eye, between two reddish brown bands. Motions quick and when feeding on ground accompanied by quick jerking of the tail.

No. 2. Rock Wren (Salpinctes obsoletus).

Dark brown or sooty above, especially on the head. Bill long and slender. Motions very quick. Worked mostly on ground, Runs or hops a few feet, then courtesys or dips nearly to ground. Observed in mesquite, bed of Mohave River, Screw-bean January 11, 1916. Smaller bird than no. 1, or at least

not so plump. Observed again about Jan. 24.- Dusky brown above. Streak above eye light-colored but not bright white or very light. Dove-color beneath. Touch of yellowish red hinder parts below. Bill long. Tail short. Sits on a small rock and bobs up and down. Runs with a hopping motion with long jumps.

No. 3. Bush Tit (Psaltiraparus minimus).

Smallest bird seen here. Olive color, darker above, light below. No prominent markings noticed. Observed Dec. 22.

No. 4. White-rumped Shrike. (Lanius ludovicianus excubitorides).

Shrike. Sitting on the topmost bough of a Mesquite bush he utters a low chortling note in trilling succession.- I suppose it a love note, so different is it from his hunting cry.

No. 5. Say Phoebe (Sayornis sayus).

Martin-like bird. Observed about Dec. 23. Observed again about Jan. 15. Dark or blackish head, wings, tail. Dove-colored breast; yellowish or reddish brown under parts. Flies with a sailing movement and quick angular turns as if catching insects.

No. 6. Sturnella neglecta.
Meadow Lark. Large numbers of them. Now more or less gregarious. Their bright cheerful note gladdens all the air these February days.

No. 7. Corvus corax sinuatus. Western Raven. I have never seen more than two flying together. Resident. — January 27 I saw 8 together on the feeding grounds at the pig pens.

No. 8. Zenaidura macroura marginella. Western Mourning Dove.
Turtle-Dove. One seen Jan. 14

No. 9. Falco sparverius
Sparrow-Hawk. One seen Jan. 27.

No. 10. Red-shafted Flicker (Colaptes cafer collaris)
Flickers. Come along the Mohave River

in the fall, migrating from San Bernardino May.

No. 11. Oxyechus vociferus. Killdeer.
Sand-piper. Along the Mohave River sands. I have heard them calling in the air as late as nine o'clock in the evening.

No. 12. Probably Western Redtail (Buteo borealis calurus).
Hawk. Observed about Jan. 15.
Grayish large bird.
?

No. 13. Desert Quail. (Lophortyx gambeli).
Gamble Quails. Resident. Large troops of them came close to the house and shop during the heavy snow storm

No. 14.
Geese, a small flock seen Feb. 14, traveling northwesterly. →

—A sparrow hawk came uncertainly down the end of the alfalfa field, flying low against the west wind. Suddenly his decision was made and he flew in hot pursuit of a sparrow which made for the shelter of the arrow-weed. It disappeared as it were in mid-air, as the hawk upon it like a bolt, fled westward as a fluff of feathers puffed out on the wind.

See no. 9, p. 12.

No. 15. Prairie Falcon (Falco mexicanus) probably.

Hawk, white under parts, rather dark head and upper parts, the body more slender than in No. 12, and smaller.

No. 16. Brewer Blackbird, Euphagus cyanocephalus.

Blackbird. Sooty brown below, darker above, with blackbird call. Observed for five weeks past but only in occasional flocks in the alfalfa fields. I can see no color markings on wings or head.

No. 17. Male of No. 16. Jet or shining black, trifle larger eye conspicuous, like a brilliant stone. No color markings

No. 18. Planesticus migratorius propinquus.

Robin. One individual, Mar. 4.

Western

No. 19. Avocet (Recurvirostra americana)

Five individuals flew by Feb. 25

No. 20. Great Blue Heron (Ardea herodias)

Sand-hill crane. Upper parts of body of a bluish cast or as if glaucous. Head white with black on upper part. Lower portion whitish. A large black and sharply defined spot-

on shoulder, or apparently on wing. When the bird starts to fly one sees that the wing primaries are much bluer or darker than the ones above. He is a sort of jack-in-the-box. He stands at rest with his white head hunched down on his shoulders and just below the head on the body the black spot is very conspicuous on a bluish ground. At approach of danger his head is elevated like a high-stretched signal. When he flies his wide-spread wings suddenly expand him in the opposite direction to the vertical. When he flies he stalks like a excessively pompous actor who struts on to the stage to settle it all.

No. 21.

Mocking Bird. Body little more than 3 inches long from head to tail, not counting the very slender long bill, the upper beak of which is curved down a little at tip. Under parts white but not bright white, a few fine flecks of dark at throat. Upper parts light brown, finely dotted or mottled with darker spots. Patch of white in middle of back and on each side of body. Top of head rather dark, especially about eyes. Sang a chirp, chirp, chirp -- followed by a flute-like warble, both these repeated through a wide variety of scale. As he sits on a rock he dips or courtesys sometimes tho this was not a marked feature of his manner as I saw him. He sat on the post holding my taut lines for half-an-hour

early this morning as I dressed; flew to the top of the hill and perched again on a post, still singing. I followed and drew near, he flew, once more, to the cliff rocks and rather near me, drawing nearer as he worked for insects, finally coming within 3 feet of me, — this advance repeated several times as he worked the rocks. He saw me but seemed rather indifferent of my presence. — March. 10.

— No. 22.
Pelicans come in here to feed on alfalfa in the summer

No. 23.
Turkey Vultures. A large flock about March 14.

No. 24.
Yellow-headed Blackbird
About Mar. 20.

— The Ecology of Eschscholtzia Calif.
The writings of those who have dealt with Eschscholtzia abound in conclusive results, in definite statements which defy challenge, in expressions of authority and I have never been able to work up to a condition where "absolutely distinct" fitted in with my ideas or conceptions of my studies. I came to results which I believed to be truly honest and the only conclusions which I could honestly subscribe to; but with all that there was ever a lurking feeling that more might be had, hidden fields uncovered, new material discovered which would change entirely what I had put down. For I had a feeling almost of eagerness that the ex cathedra decisions deserved such discoveries, and that it would be almost a pity for the world to lose so great a harvest of positiveness.

Cf. 31:17.

Barstow

2200 ft.

Cont: from p. 9. – Jan. 18. – Rained heavily all night, as it does on the coast. This morning it continued to rain heavily with some interruptions until noon. The river-bed was entirely filled with water, two raging currents running, one thru the piers of the railway bridge and the other thru the trestle work, really all one deep current but separated by a flooded line of screwbean. Early in the morning we received word that the approach to the county bridge had gone out, and a little later that the trestle bridge was swaying. The waves or rollers of sand-wheels were, I should say, four or five feet high, and washed the piling with great violence. There is no rock-bottom here and the concrete piers go down about 25 ft. and rest on piles driven down 25 ft. A heavy gale blows from the west and now word comes that the Bear Valley Dam has broken. Such a drenching the Little desert has not had in a long time and if spring showers follow the desert vegetation will be phenomenal. → Cont. p. 23

No. 6590 Chorizanthe rigida T. & G.

The little red plants, dry, hard, rigidly spiny and of course dead, are often abundant in places on the mesa which they favor; but one sandy sees them on rocky slopes, and they must have been abundant last spring. It is the only annual, I see, quite intact from last spring's growth. – January 8.

No. 6591. Prosopis pubescens Bth. Screwbean. The young shrubs or the stump-sprout growth bristles with its long white spines. These spines are 6 to 11 lines long. The twigs in the top of the tree remind me of Locust (Robinia pseudacacia). The spines are short (1 to 4 lines long) and reddish. See no. 6592.

– The Mohave River has been a mere trickling stream since last summer. One can walk across the shallow waters and wet the shoes but little. It is a narrow red trail of dark blood, as it were, down the sands of the Mohave, since its slow surface is covered with a skein of reddish-brown plants of Azolla:–

No. 6591a. Azolla

– Atriplex torreyi is evergreen. Also A. polycarpa; also A. hymenelytra. Doubtless all the shrubby species are evergreen. So is Suaeda torreyana after a fashion.

No. 6592. Prosopis pubescens Benth. Winter branchlets; from top of tree. Mar. 5, 1916. See 6591.

– Cont. from p. 20. The storm still continues with whiffs of rain. The river has fallen but a considerable portion of the railway bridge has gone out, so that now we are cut off from mail and supplies. The thickets of Screwbean Mesquite (Prosopis pubescens) lay right in the path of the heaviest currents and comparatively little of it went out. It is wonderfully well anchored by the cables of its root-system. Probably no Willow would stand as heavy buffeting by the waves as has fallen to the lot of Prosopis pubescens in the river bottom the last two days. Waves ran as high as five feet from trough to crest. We now learn that the storm has been very severe over all Southern California, one of the great storms category. – Cont. p. 37.

Barstow 2200 ft.

– Galoroan (spelled phonetically), a miner from Superior Valley, marooned here by the storm, says: Sheep cannot do well in this country. There is not enough variety to the feed. If Sheep have to live on Gietta grass alone they will at last die. So, with Bunch-grass too.

Cattle die in Superior Valley from eating Loco weed. There is so much of it. Horses select it, as they relish it, and also perish.

– Another storm broke. It rained steadily Friday morning Jan. 28. In the afternoon the wind increased in violence, blowing great guns by four o'clock and continuing into the night. Some people here at the ranch were much frightened by the intensity of

the gale. The next morning a traveler came in from the San Joaquin Valley, and described a cyclonic storm near Bakersfield which laid low buildings and wire lines. The horse, he was driving, a sure animal, got down on her knees in harness, – a sure sign of something very unusual. It rained 5.93 in. in 24 hrs. at San Bernardino on Jan. 17

Over the low rim of the hill ranges one sees on bright days the clear brilliant snowy tops of mountain peaks far away – the several summits in the San Antonio Range, the slopes of Ord, and higher a bit on the mesa, the high back of San Gorgonio.

– LeConte Springs. Galiday, a Mohave desert man, says there is a LeConte Springs near East Ord Mts., called after an old prospector of that name. It may be that springs mentioned by me on West Ord should have been looked for on East Ord.

— In the years 1880 to 1887 the Waterman worked their silver mine in the desert ? circa 1882, near here. It was then that Lemmon made his trip to Waterman in the Mohave Desert and to Calico, which latter was then a flourishing camp. "Governor Waterman felt very friendly to the Lemmons" said Dr. Helen Waterman. "No he didn't; he just Tolerated them" said Miss Abby Lee Waterman. "They were very kindly and sincere" parried Dr. Helen Waterman. Anyway I had wondered however the Lemmons or Mrs. Lemmon got to Calico. They were frightfully impecunious; and they had an assurance and presumption in certain contingencies born of their dreadful impecuniosity. It is dreadful to be real poor for most people. It takes people of exceptional strength of character to stand such mean poverty as the Lemmons labored under. But of course the real handicap of the Lemmons was not poverty. People have so often, so often, asked me of Lemmon's ability as a botanist. And I reply: Lemmon did excellent work as a collector. While ordinary collecting does not require a very high order of capacity, but the exercise of common virtues such as care, patience, industry, preservance; yet acute observation makes an exceptional collector and this, a rare gift, Mrs. Lemmon had. In publication Mr. Lemmon did not do very much, outside of his fairly

good work on the conifers, where he really did very well. The trouble with Lemmon was a striving after the insubstantial: an inordinate lust to be called Professor Lemmon; a filling up of his book with Latin words which meant nothing much and nothing at all for his particular audience — Latin words of classification and so forth; an avoidance of simplicity when he had a natural gift of simplicity; a hungering for an honorary bachelor's degree, or master's or doctor's, from the University, — All this showed to the real observer of human nature, who was not swamped by Lemmon's enthusiasm and kindliness, that he had not the power to strive single-mindedly for

the real things; but as I say for insubstantial ones. Fancy John Muir, the sturdy rugged Scotchman, contemporary of Lemmon, desiring to be called Professor! The thought makes one laugh. Yet he came to California poorer than Lemmon. But there was a certain few things Muir believed in terribly or rather I should say with all the deep ardor, or one almost say fierceness of his temperament, that is in a very deep, but not tempestuous way.

It is interesting incidentally to note Muir's wealth on his death. He left $184,000 in cash in savings banks and a total estate of about one-fourth million dollars. To be sure he married a well-to-do widow,

but I judge Muir made at least half of it, if not more; for he made big money out of the vineyard at Martinez and was much peeved when his son-in-law, Tom Hanna, succeeded to its management and lost money.

Lemmon made a job for himself by getting a bill for a State Board of Forestry thru the legislature, whereupon he was appointed "State Botanist."

Dr. Helen Valentine helped in those days to guard her father from interruption in his hours of rest, at night and on Sunday evenings. Sunday evenings were held particularly sacred. On Sunday evening came Lemmon to call (with his bill). Helen explained to him that business was impossible on Sunday evening and that anyway her father knew the bill, approved it, and would sign it. "Well, then could he read half of it"? No, no, he must not. "Will just one page of it?" (since debarred from reading all of it!). No, please not. Will, at his usual hour the Governor came down into the parlor and met his guests. Every once in a while Lemmon would edge around to Helen and say "Just a few paragraphs"? or "Will, just one paragraph?" But his pertinacity did not avail him. Helen was firm!

But the most retrieving of all memories is Mrs. Lemmon's brief in Mr. Lemmon. She was his constant companion, staff and support. She entered thoroly into his life; ardently, and

enthusiastically, — so that they became one in twain. Thus it was that she forced herself unbidden into the banquet in honor of the visiting botanists from Europe, and seeing that Mr. Lemmon was not evidently to have mention, she rose and interrupted the proceedings, feeling that she must speak for Mr. Lemmon since he was not there to speak for himself, because (as she felt with her whole soul, quoting the fine interpretation of her action as expressed by one of my friends), this was a great refutation which had never received recognition. (Cnt. p. 35, at bottom.)

— Rabbits are plentiful here and enough so to be a pest, eating half the first strip of alfalfa at Waterman Ranch.

On this first strip their droppings lie almost as thick as "mannie-beans" in a sheep-fold. In fact I thought they were sheep offal but the Rabbits' dung is rounder, not so hard, and mostly lighter-colored. One can pretty surely learn which plants, of what kind, are used as food by Rabbits, since their droppings lie very thickly.

— Prosopis pubescens 8th. A poor firewood; gives out little heat.

— The roots of Arrow-weed (Pluchea sericea) are thick, a little fleshy on the surface and "rooted" by twigs, and heavy and go straight down. The Arrow-weed thickets offer the best and only real protection for a sleeping place in the open during the terrible high and cold winds which sweep the desert. But I have never noticed the hoboes adopting a simple expedient there

cold nights, — digging a trench in the loose sand, building a fire in it until the earth is good and hot, then making one's bed in the trench. Even without blankets this is an expedient of great value.

— Ord Mt. According to Galliday the mountain which I visited in May, 1914, and called Ord, is called West Ord by miners and prospectors in the region. Ord, proper, is east Ord. Cf. p. 25, at bottom, and my note on Mendenhall's map in field notes for 1914, vol. 30. p. 63.

— We cannot get ford the Mohave River. Where the water runs swiftly the sand forms a hard bottom, but the water is too rapid and deep;

where the water runs into still pools or slow eddies there the silt forms quicksand.

— Distichlis spicata. Lies in dense heavy masses on the banks of the "checks" and irrigating ditches. Neither cattle, pigs or horses will touch it in its present state. Hogs dig for its roots, however. Its presence is to a certain extent a water indicator, — water within 2 to 4 feet altho in other cases it may be 10 to 20 feet. No water.

— Populus Fremonti. Foliage nearly all gone. Buds swelling strongly. But there is still considerable foliage on all older trees.

— Mrs. Lemmon, says Dr. Helen Waterman, was recently taken before the County Court of Alameda on a lunacy charge. Mrs. Mark Regan came to her rescue and had her consigned to the Kings' Daughters.

Cont. p. 36.

It seems that she went out with a broom and stopped street-car and other traffic on Telegraph Ave. in front of the "Lemmon Herbarium".

— Atriplex confertifolia. Spiny Saltbush. A medium-sized bush 5 ft. 6 in. in diameter and 2 ft. 6 in. high (heavily loaded with fruit, characteristic of the string-bearing bushes of this last fall) had on it according to my calculation 193,000 fruits. This is an under calculation rather than an over calculation in my judgement. Perhaps 1/3 of the fruits still remain, and bear some of the branches to the ground.

— Madrona. This form of spelling is used in Brooks' Boy Emigrants, p. 232.

— Vitis californica ?* There are wild grape vines at Newberry acc. J. H. Manson. There is also a marshy place at or near the big spring where the grape vines grow, with unusual plants. There are a few artesian wells near.

* = Vitis girdiana Munson.

— It is a great sorrow to lose Professor Hilgard, news of whose death comes. He was a great man. Moreover he was a true friend and not afraid.

— Cont. from bottom p. 23. The storm continued some days and was very severe all up and down the coast. The property loss in Southern California was very great, especially to roads and railways. It strikes me as very wonderful, this Mohave River. It runs thru a sheer desert but

the water which fell heavily there for two days made no stream to speak of. The desert drank it up. And yet here comes a huge and angry flood down the river. It tears out bridges, washes away whole farms, drowns livestock, engulfs barns and houses. Standing in the yard of the Waterman ranch-house one can southwesterly over the crest of the hills the tops of the snowy peaks of the San Antonios. It is from that region and especially the high San Bernardinos that a flood is massed and suddenly projected out onto the desert, and far a long distance. Standing near the railway bridge I could hear, on the evening of Jan. 17, the

front of the flood coming, near it miles away, roaring steadily on its way, roaring like a great beast of the wilderness, roaring, coming, coming, and finally bursting upon us wreaking destruction. But after all it makes, even in summer, a path or trickle of water across the desert, and by following it the early explorers, Fremont and others, were enabled to get across. – The stars are showing finely these clear nights and in addition we now have a fine array of planets in the evening sky, burning brightly in the desert air. Venus and Jupiter are very near together, nearer than I ever saw them before, in the western sky. Saturn is high in the heavens and red Mars in the east.

—Miss Mary E. B. Norton. An old-time teacher and public-spirited citizen of California who has long worked for the interests of California botany. As much as any one person she may be said to be the founder of the Pacific Grove Museum. She taught botany in the San Jose Normal long ago and everyone had the greatest reverence for her. She had a brother, Professor Norton, who was long a power in the Normal and much beloved. She was a relative also of the celebrated Charles Eliot Norton of Harvard. Miss Norton was not very practical in some of her plans, as for example the East End Settlement work in Oakland, but she had the vision to see the need of

such work and secured its establishment. Such people are often called visionary; but in a good sense she was, indeed, since her prophetic eye saw the way to certain plans for the State weal and gave to others the inspiration to see also and to carry them out. It was a great pleasure to me to receive the following from her: "I am sending you with Christmas greetings my earnest wish for your speedy recovery and the hope that there may lie before you many years of noble achievement and usefulness. From your octogenarian (plus 3) friend, Mary E. B. Norton, Pacific Grove. I wrote her: Your message has come to me like a benediction. I am both

and glad to have it."

— The feeding of horses on trips in the desert is always a great problem for a botanist. It is worth noting that all grains, such as barley, are fed cooked to horses in England. This might be worth doing in the desert in order to get full value for every pound of grain carried.

— "I have come to this conclusion that there has been no advance either in intellect or morals from the days of the earliest Egyptians and Syrians down to the laying of the latest dreadnaught" — Alfred Russell Wallace in an interview, on his 90th birthday, 1913.

— Ephedra

the species on the desert, are called, here, Desert Tea, Squaw Tea, and Joint-Grass. The various species here are not distinguished by common names.

No. 6593. Chrysothamnus nauseosus var. ginaphalodes (Greene) Hall

Heavy or rather dense shrub 3 to 5 ft. high. River bottom, Barstow. 18 Jan. 1916.

No. 6594. Haplopappus acradenius (Greene) Blake

Bush 1 1/2 to 2 ft. h. with 6593.

No. 6595

Lichen, on ground. Barstow, Jan. 4, 1916

No. 6596.

Lichen, on rocks, with 6595

Calico Wash

n. of Daggett. 2500 ft.

No. 6597 Stanleya pinnata Britt.

Four to 5 ft. high. The woody base of the mature shrubs is decidedly woody. I bring into my headquarters station at Barstow a plant 5 ft. tall, the woody portion being 2 ft. high, branched from at the base, and bushy. This woody portion is topped by long slender flowering stems which are simple and annual. Their very bases (that is bases of the flowering shoots) give rise to rosettes of new leaves which are just now coming. This new growth is all from lateral buds and is borne almost exclusively on last years wood, that is the lower part of the simple flowering stems. These stems bear buds for 2 or 3 inches, sometimes

six inches or a foot; so the dying back is not as much as I have implied above. But the general effect, in looking at the shrub at this time, is of a shrub with its whole top winter-killed. I measure one shrub with a simple flowering stem 3 ft. 4 inches long; only the lower 4 inches is bud-bearing or leaf-bearing. Other stems have somewhat more persistent base. Main stem at base = 1 1/4 inches in diameter! Some of the capsules have not yet completely dehisced and bear seeds. Roots rise of a whipcord = 4 ft. long, running along surface of wash.

— Rode or rather drove behind the Hacks with Mrs Waterman beyond first summit into the wash beyond on road to Coolgardie. The Calico Wash is still in the embrace of winter and nothing

was found in flower. The wind is blowing from the west today and a long line of dust marks the path of the Mohave River, the evidence of its sandbars.

To the west of the ranch, away up the Mohave, is a line of desert hills which lie a little below the horizon line as one looks at them from here, their tops rising into view but their bases hid. All day yesterday a line of dust smoked at the base of those hills, as if vehicles passed along a great north and south highway there. That is a sign from here. Today the wind makes known the line of the Mohave River, tomorrow it will blow great guns and the whole desert will be enshrouded in a dust

cloud hiding hills and town half-a-mile away!

Returning over first summit, the rock-piles in the wash below it a half-mile were bright-yellow in spots and brown in spots with two lichens, namely:—

No. 6598.
Yellow lichen.

No. 6599
Brown lichen.

No. 6600. Atriplex hymenelytra. ♀. Just coming into anthesis.

No. 6601. Same. ♂
Hardly any catkins at all open as yet.

— The mass of Old Mt. shows up finely today. So does Stoddard's Peak which lifts into its proper position at this altitude, near first summit.

– As soon as the new growth of Atriplex torreyi appeared the horses, cattle, and hogs after their winter in the alfalfa field began to nibble eagerly at the foliage of this shrub wherever they had opportunity or when they were turned into the summer pastures.

A heavy windstorm yesterday shook down many small + some large branchlets from the Populus fremonti trees. These were gathered up and put into the pasture edge for the horses; they not only cleaned off the leaves but also the bark. The racemes of female pods, at this time, look not unlike gooseberry bunches as they lie on the ground. I noticed that the hogs ate eagerly of them. The cattle likewise eagerly devour Cottonwood foliage. — Mar. 24,

– The whole Mohave is today no fit habitation for man or beast. March is a raging lion, howling everywhere throughout the wilderness of the desert. The whole sky is a dirty brown, filled with a dust cloud of sand, blotting out everything. The wind is west, raging and storming, the sand shot with it along the ground as if sent from a gun. One does well to see half a mile, and it is well nigh impossible to face it with open eyes.

The dust sifts into the house everywhere and in the adobe quickly covers all with a thick layer of dust. Even the open page of the book one is reading becomes gritty before one can turn the page! Jennie the cook is a portly negro woman of 280 pounds; she is stricken with fear by the terror

of the wind. The wind rages; it is a giant demon, whipping the ground, and the sand flies as if shot from a gun!

The next day it fell calm. It is as beautiful and sweet and tender a day as ever blossomed forth to gratify the eye of man. Jennie the Cook smiled as if rescued from death: "Now, ain't dis beautiful? Quiet and saying nothing, cause terrible shamed of what it did yesterday. Just like some mean folks; when they's shamed and are so quiet and so nice to make up for what they done!" Thus Jennie!

One of Jennie's folk phrases during the rainy period was:

"Rain before seben
Clar before leben"

Jennie speaks of having run down to 192 pounds during a spell of sickness.

— The father of practical California agriculture is Professor Wickson, as Professor Hilgard is the founder of scientific agriculture in California. He, Wickson, writes me delightful notes. No one else has done so much as Wickson to cultivate amongst the people a love of planting & growing things. He is, too, full of humor as one knows who reads his paper, the Rural Press. He is at times an old wag. Some one tried to start a boom on raising castor plants on account of war scarcity. He discourages this a bit but acknowledges castor oil has risen in price when to do its work it ought to stay down! Acknowledging his kindness I have written a short note and added:

— over —

Barstow

Mohave Desert.

"We too have had storm excitement. The San Bernardinos gathered a huge flood in their cañons and sent it suddenly like a wild beast of the wilderness roaring down the tiny trickle that marked the bed of the Mohave River. One night I stood for an hour in the spatter of rain at the railway bridge listening to its roar, miles away, ~~as~~ its front raging on towards us, taking out whole ranches and engulfing livestock".

No. 6602. Lepidium flavum Torr.
Flowers yellow; stamens 6. Stems spreading on the ground and forming a sort of rosette, the flower-clusters at the end of the stems and in the centre. Low places on lowest river bench.

No. 6603. = Descurainia pinnata Sisymbrium pinnatum Greene.
Flowers pale yellow. With 6602. Erect plant.

No. 6604.
Plants decumbent, the stems from the base. The leafiest plants are the more backward in flowering and are the only ones that now show good flowers. On the sheet marked "A" I found flowers in anthesis near or at the tip of the stems. Most of the ovaries, if not all, appeared to have a single stamen with a large

conspicuous anther on the lower side and closely subtended by a sepal (?) or calycine bract. Having only a coarse lens this is all I am able to record. The flowers are very crowded. Surface of ovary as if honeycombed; styles 2, united at very base. with 6602.

No. 6605. Prosopis ~~juliflora~~ glandulosa Torr. var. Torreyana. Winter condition, showing especially the developed leaf-bases which become almost like spurs, recalling a little those of Ginkgo.

No. 6606. Lycium pallidum Miers. Shrub 1½ to 2 feet high, and as broad or mostly broader. The shrubs in their winter condition are naked and it is only then that the thorniness comes into full

prominence, hundreds of thorns bristling all over the plant, being thickly set along the stems. The leaves burst about two weeks since and now the thorns are mostly masked by tender light green foliage. This species is now the most grateful bush to the eye on the desert, — its hue is very green and it makes patches of verdant color. very attractive

The flowers are now coming. A few shrubs are in full flower. This species is the first thing to flower on the desert. Corollas lavender, 7 to 9 lines broad, fading pale yellow, narrow bell-shaped, with rotate border; corolla about 7 lines long, as much as 9!! Stamens well-exserted, below throat very hairy, of course adnate to tube below. Style glabrous; stigma not obviously lobed, indeed, I think, not 2-lobed in the least.

-Cont.

The foliage color, now, is light or pale green, the leaves a little glaucous. Dark or brownish lines in cor. throat branch palmately on edge of limb, forming a sort of eye to the corolla which comes into prominence as the corolla changes from lavender to yellow. A scarlet zone covers the lower half of the ovary which is glabrous. See p. 99. See p. 63. See p. 71. See p. 73.

— There is no change in the general aspect of the desert now that spring is come. The ever-present Larrea mexicana still wears the dull yellowish foliage of winter. Franseria dumosa, presents its ever-present gray. It is more common in individuals, in many places on the mesa, 10 or 20 to 1, than the Larrea, but it

makes no such show at a little distance because melting so readily into its background. — But other things are changing. Lycium pallidum [Miers] has been a bush of ugly thorns all winter and its thorns are now washed in tender green. It happened so suddenly I did not see it: I scarcely caught the intervening new foliage of Spiny Saltbush (Atriplex confertifolia) so quickly did it appear. Leaves 2 or 2½ inches long of Eriogonum inflatum form a rosette above ground, new & green. I did not see them come although I walked the ground. The annuals I have observed almost every millimeter of growth, but the perennial things have largely escaped me; I mean as to their minute steps; so quickly they worked.

– A beautiful quiet sunny day; driving behind the Blacks with Miss Waterman to Daggett.

– Populus fremontii – individuals in full leaf still, i.e. with old leaves, the new leaves just beginning to burst, and showing a little against the dry foliage. The old leaves are still "fast" and can not readily be pulled off. A number of such individuals were seen near Compton's Ranch.

– Phoradendron

Great bunches of mistletoe fill the tops of clusters of Screwbean in the river bottom below Compton's Ranch. I was struck by the masses of it, which occurred in such a way as to be a marked feature in the local landscape. It was not merely that there was so much it, –

but it was massed in a clump of trees or series of trees so as to produce a very striking effect. Of course the eye gets the full benefit of it now, because the Screwbean is leafless in the winter.

No. 6607. Phanopsma montana Torr. and Frem. I had seen this in flower only once or twice before, – one or two belated flowers scattered over a bush, so that I had an impression in my mind of its flowering very sparely. In a wash near Lead Mountain we came suddenly on a bush in full flower, – covered all over with a profusion of flowers of an indigo color. The bush was 6 ft. broad, 1½ feet high, of circular form and full regular outline. It was a highly interest-

2100 ft.

ing and indeed rather beautiful object, with its effect of particolored flowers eagerly sought by hundreds of buzzing bees. It is the finest, that is best developed bush of the species that I ever saw, altho we met other good-sized ones (likewise in flower) further up the wash.

See p. 66.

No. 6608. Atriplex hymenelytra Lead Mt. ♂. Staminate spikes 1/4 or mostly 1/2 to 1 inch long, the flowers in definite clusters on them and therefore somewhat as if spikes simple or the longer mostly with a few short forks. Flowers about 5 to 7 in a cluster.

No. 6609. Atriplex hymenelytra ♀. Lead Mt. Pist. spikes similar to ♂. Neither ♂ nor ♀ have bracts. Spikes axillary and terminal ♀ on the branchlets.

— As we circled the northeasterly corner of Lead Mt. there came into view the open country of the Mohave River valley below Daggett, bounded on the horizon by most interesting peaks and ranges. In the centre easterly is a range, lying between the forks of the railway (Santa Fe, right, Salt Lake left) which seems to have sand-dunes rising on its sides, making light-colored areas which contrast very finely with the purplish slopes or outcroppings between. The jagged or geometrical outlines of other peaks or ranges complete an interesting picture. Immediately to our left rises finely the high mass of Calico — blood-red spots, dull browns, bright slates, clear lawny slopes, bright green hillocks — and so on to yellow — this makes

Calico! From Daggett we can see far up the wash northward to Buttes lying on the upper slopes - this wash being along the Calico Mts. is called by me the Calico Wash! And the water from the rains which fall in such a place is the wash water! Far down the Mohave River valley we can look, too, from Daggett, to most attractive mountains very far away. The sharp regular cone of Iron Mt. claims first attention as a very definite landmark. The range running towards Ord holds allurements for the eye as always. Coming back, we reach the top of the hill near Barstow and turn for a final look. All the Calicos, in the evening light, are like old copper!

- Miss Mary Beal, a health refugee at Daggett, is planning to do some botanical photographing for us. She has done some rather fine things on a broad scale:

1. - A wide sweep desert land with creosote and a desert range in the far background.
2. - Desert Willow at Camp Cady.
3. - Old buildings at Camp Cady.

(Miers. No. 6606.)

- Lycium pallidum } Going fast its best flowering about Daggett. Its leaves are the most watery of any shrub on the desert. Its foliage is quite succulent and not bad-tasting. Indeed Mrs. Forbes comes in this morning and, seeing my specimens, says: I feed this shrub to my rabbits (Belgian Hares) and they will leave anything else to eat this. They even eat the thorns or grow them

I have called it- Water Thorn to people on the ranch (who always demand a common name), but- Rabbit- Thorn might be better.

- At Daggett we visited the Van Dyke Ranch. We did not find Judge Van Dyke but met his two children, a boy and girl now grown. These two were never sent to school, Judge Van Dyke not believing in schools. He set his children down at a table, put a book before each, which was to be read or studied for two hours. They are remarkably well-informed and intelligent, considering their kind of education. But they have a good inheritance, being descended from Jonathan Edwards. Judge Theodore Van Dyke is the author of the "Still Hunter" and other books, and is a brother of Henry Van Dyke

who wrote "The Desert" etc.

No. 6610. Populus fremontii. ♂

No. 6611. Populus fremontii ♀

Barstow. From trees planted about the ranch house at Waterman Ranch but from the native trees along the river.

no. 6607.

— Cont. from p. 60. Corolla indigo blue, 4 lines long. Stamens 8; fils. glabrous. Style glabrous, exserted. Branches + ovary thickly sprinkled with "turpentine" glands; similarly the corolla but less thickly. Ovary raised on glandless stipe nearly as long as itself; style set between the lobes of the ovary. For desert people who insist on a common name I have called this Indigo Bush, Indigo Broom, Turpentine Broom, Bee Broom, trying one after another in pursuit of something fitting.

— Vitis californica? J. H. Munson says there are wild grapes at the great spring in the desert at Newberry. The spring is now the property of the Santa Fe. = Vitis girdiana Munson.

No. 6612. Lycium andersonii Gray.

Barstow. 16 Mar. Corollas varying much in length even on same branchlet, 4 to 6 lines long! Limb very small as compared with No. 6614 being only 2 to 2½ lines in diam. Cont. p. 69.

No. 6613. Oenothera

Lead Mt. The dead fruiting plants which have stood all winter where they grew last summer. 8 Mar.

No. 6614. Lycium pallidum Miers.

Daggett. 8 Mar. 1916. See p. 71.

— Atriplex torreyi. Bursting into leaf the last week. Some of the old leaves still persistent. None of the Atriplices here can be said to be truly evergreen, but this is nearest. A. confertifolia lost nearly all its leaves as did A. microcarpa. A. hymenelytra is a true evergreen, but the other species here lose their foliage in the winter by weathering. a good deal of

Near Barstow, 2100 ft. Mohave Desert

– Drove behind the blacks down river in quest of spring flowering and to photograph mistletoe.

No. 6615. Rumex hymenosepalus Torr. I had thought of this as tall, an idea which got stuck in my head without warrant and perhaps found expression in the flora. Occasionally it may get tall but the plants develop flower-bud clusters from their rosettes of basal leaves and elevate them on flowering stems not very much before the buds come into anthesis. I should say flowering stems 1/2 to 1 or 1 1/2 feet high on the average at this period of development. I measure a last year's (dead) flowering stalk 3 feet high. – Near Compton's Ranch. See No. 6627

No. 6616. Phoradendron californicum Nutt. This forms great colonies on the Mesquite (Prosopis glandulosa), so much so as to feature in the landscape! – Below Comptons.

12 Mar. See note on p. 58 preceding. Berries at first red, later clear white, globose, 1 1/2 to 2 lines long.

– Lycium andersonii Gray. No 6612, Cont. from p. 67 at top. Corolla apparently white but really a very pale lavender a grey yellow (the yellow of a lime color pretty nearly) Corolla lobes 4, sometimes 6. Stamens unequally exserted. Stigma green, in throat, not exserted. Leaves very fleshy & watery, 1 1/2 to 3 or 4 or 5 lines long, on minute petioles (very filiform but short) 1/4 to 1/2 line long. Flowers & leaves in a sessile lateral cluster on the old or last years wood. But this branchlet, so abbreviated that it is not abbrev except histologically

-cally, develops usually another rosette the next year so that a leaf cushion or finally a very short stem develops. Shrub intricately branched. Branchlets short spinose. When one branch is laid on another in field collecting they are sometimes difficult to disentangle. Shrubs 1 to 3 ft. high and as broad. Deciduous. Flowers mostly horizontally spreading or hanging. Bark often grayish brown. Stamens a little woolly at base. Style glabrous. Common name = Matrimony Thorn. Cont. p. 73.

— Key to Lycium spp. of Barstow.

A. — Erect shrubs, bushes, 2 to 6 feet high.

Calyx over half as long as the broadly tubular corolla, its lobes spreading. Flowers dull white somewhat strictly included. in a cluster 1 to 3. Stamens

L. cooperi Gray. No. 6636

Calyx less than half as long as the narrowly tubular Corolla, its lobes strictly erect. Flowers lavender-purple in a cluster 3 to 7. Stamens exserted.

L. Torreyi Gray. No. 6640.

B. — Dense spreading bushes, very thorny.

Miers.

1. Lycium pallidum (No. 6606, 6614).

Branchlets modified into regularly placed self-opp. thorns. Calyx teeth as long or longer than tube, spreading Corolla limb as broad as corolla is long. Fls. mostly horizontal. Corolla lobes 5, often 6. Thorns shorter than in next.

2. L. andersonii Gray. (No. 6612

Branchlets spinose, but not developed into regular thorns. Calyx teeth 1/4 to 1/3 as long as tube, strictly erect. Corolla limb diam. 1/3 to 1/2 length of tube. Flowers mostly hanging on under side of limb. Corolla lobes 5 or 4. The thorns when well-developed are very needle-like!

This is a correction of statement just above.

Barstow 2100 ft.

No. 6617. Lycium pallidum Miers
Shrub 1 to 3 feet high and as broad. Flowers white, very pure, a branchlet a little suggestive of stone fruit blossoms of early spring.

No. 6618. Lycium pallidum Miers
Flowers pale to a rather deep lavender.

No. 6619. Atriplex

- Lycium pallidum no 6606. When the leaves go off this in the winter its thorns show up in fine style. There is no thornier bush in the desert, outside of Cactaceae, hereabouts. Miss Waterman calls it "Thorn Bush". L. andersonii (no. 6612) has very needle-like thorns and is less conspicuously thorny in winter. The flowers of 6612, when taking on their second color stage, change to a yellow which is the color of a yellow horse ("buckskin"). This latter describes the color than the term used on p. 69.

— The Mohave River Valley is now transformed by the sudden outburst of foliage of the Cottonwood, its fine clumps of green are a delight in this desert scenery. The glory of the Cottonwood is one of the sweetest and truest pleasures to the eye in this land.

— I have just written to Mr. Parish, asking him to do Cactaceae for the "Flora of California." It has long been in my mind to ask you to do this but — I have been deterred by the fact that on several occasions you deplored the unsatisfactoriness of botanical collection and study of our Cactus species. I take it, however, that you have been guided chiefly by taste in selection of botanical work and I now set aside all further consideration for your inclinations, out of my judgment, Sir, that it will be good discipline for you, before you grow old, to do some things you do not like!"

Mr. Parish is well advanced in years now, but I do not believe his nature, simple, genial, delightful, will ever grow old.

No. 6620. Gilia ~~tenuiflora var. sinuata (Dougl.)~~ davyii Mekn., not G. G. latiflora ssp. latiflora
Corolla light blue outside, bluish or violet tinged on a nearly white ground inside; 5 yellow spots in lower part of throat (opposite lobes); below these, in mouth of tube, + opposite them, 5 purple "spots", so deeply "3-toothed" are their purple color areas as to suggest fleur-de-lis design of convention a little. Corolla 8 lines long, 9 lines diameter of limb. Stamens inserted high on throat. Stigmas (3), slender. Calyx-teeth acute, their membranous margins running down tube or rather the membranous tissue continued down tube between the green ribs. Stamens, style, corolla glab. Calyx with short gland-tipped hairs. Upper portion of herbage similarly glandular. Lower portion glab. or the basal leaves a little woolly above, i.e. on upper side. Flowering cymose.

Style-branches stigmatic their whole length, inside, fully 2 lines long. Sandy river bench, low lands. Corolla fading purple in drying.

– The sunrises were much finer in Dec. + Jan. than they are now, perhaps because of colder air. Aurora wheeled her chariot in the East then and painted apple-red scenes on a grand scale.

No. 6621. Phacelia bicolor Torr.

No. 6621a Phacelia fremontii Torr.
Corolla lavender, (fading in drying, red-purple) throat and tube yellow; limb 6 lines broad; corolla 6 lines long. Stamens glab., unequal, inserted nearly at base of tube. Stigmas terminal; style 2-cleft very shortly but very distinctly; ovary and lower part of style hairy. There are at least 6, probably 12 ovules in the 2-celled ovary. Calyx-lobes distinct or nearly so, linear-spatulate, i.e. narrowly linear and dilated at tip,

2 lines long, hairy, Stigmas strictly terminal as said, and subcapitate but rather obscurely so. Sandy river bench, amongst salt bushes. Has been in flower for about three weeks, — but not yet at height of bloom.

No. 6622. Astragalus lentiginosus var. fremontii ~~coulteri Bitter~~. Corolla red-purple, 5 to 5½ lines long, Banner nearly half longer than wings, notched at apex, 3½ lines broad. Pistil obscurely & minutely hairy. Calyx canescent, 2 lines long, its teeth acute, very short. Stems decumbent or ascending. Has been in flower for three weeks at least. Pods light-green, mottled with reddish brown spots. On sandy river bench.

No. 6623. Lepidium apetalum. I have never seen anything like this in northern California; certainly not in flower. It is quite apet-

alous, the stamens 2. The quickly developing young ovary is flattened fore and aft, a line from the flowering axis to the compressed pod meeting it at right angles. One stamen stands on each side of the pod, that is one next the axis and one away from it. Each stamen's anther is covered by the tip of the sepal to which the stamen is opposite. Plants erect; on low river bench. This no. cited in Fl. Cal. as Lepidium densiflorum Schrad.

No. 6624. Blitum capitatum = Chenopodium c. Low sandy river bench. Stamen 1, always next the subtending bract or leaf when such is present.

No. 6625. Lepidium flavum Torr. It has the distinctive pepper-grass or tongue-grass odor! Low river bench, sandy soil. Stems decumbent or prostrate; very brittle at the forks or joints.

No. 6626. Populus
March 22.

No. 6627. Rumex hymenosepalus Torr.
Out of the material collected at Compton's Ranch, See 6615, the cook made a sauce just as we makes a rhubarb sauce. It was really very good and had an excellent flavor. Hoyzies Alvey, one of the ranch men took to it particularly. It was sweet and quite tart. This acid sweetness will explain that ants attacked the 6615 spms. and quite ruined them by devouring considerable portions. It was necessary therefore to re-collect to day more spms. here at Waterman Ranch; but they are not so fine as 6615. — Mar. 26. See no. 6645

— Going into San Bernardino on the train Miss Waterman heard a man explaining the scenery to another passenger, a woman.

Them's Yucca trees you call 'em? said the woman

Yes, Yucca replied the man. I suppose they 'aint good for nothing? said the woman

No they aint good for much replied the man. ~~They~~ Just stand up in the desert.

I thought that was a right smart bit commented Miss Waterman and so do I. Anything which can stand up in the terrifying desolation of this desert has to have backbone and then some more backbone. It's a great feat for any living thing to stand upright in the awful wilderness of the

Mohave. Mrs. Dilly Thurber, whilom cook at the Waterman Ranch says that cattle in Kelso Cañon eat the great buds and flower clusters off the Yucca arborescens in the case of the young trees that they can reach. She says that in Kelso Cañon they grow very thickly, these young ones, so thickly that you can't ride a horse amongst them. A new forest of them she called it. J. Herbert Manson here at the ranch confirms this fact of their occurrence and says they also grow and very abundantly locally in Red Rock Cañon. Both these cañons are on the South Fork Kern River. He met Yucca of the tall branching type a half-day's journey before

reaching Walker pass, while going east.

— Wm. S. Lyon, who discovered the wonderful Lyonothamnus on Catalina Island, was a gardener in Los Angeles. He wrote a book on gardening of which I have just seen a third edition. — "Gardening in California" published by Geo. Rice & Son, Los Angeles. — (M. L. J. May, 1916).

— "Fremont and 49" Dellenbaugh. 547 pp.

— Fremont, John C. Life, Explorations and Public Services of. By Chas. W. Upham. 12 mo. 355 pp. First Ed. Boston. 1856. Noted in a Rhoads, Phila., cat.

Boolgardie Yucca Mesa.

2800 ft. +

No. 6628. Phacelia fremontii Torr. Corolla light blue or pale lavender with yellow throat & tube. – Calico Wash. Corolla fading deep purple! in drying.

No. 6629. Ellisia membranacea Bth. In shelter of Larrea. Corolla lobes with a purple point like an upper part of an exclamation pt. reversed on lower part of lobe. cont. p 85.

No. 6630. Eurotia lanata Male bush; flowers unisexual 4-merous as I notice them – 4 stamens; 4 sepals. Miss Waterman calls this "Lamb's Tails," a good name and very apt for the fruiting shrub. Male flowers only.

– Drove Friday with Miss Waterman behind her blacks to the Yuccas. [Williams Well is about 5 mi. beyond second summit. We did not go there.]

– [nearer 3500 ft., judging by Searles Lake map.]

– The Mocking Bird is abroad in the land this morning, flinging his jubilant notes afar over the mesa from the top-top of a Yucca branch. There is a chorus of bird voices, too, over the mesa and one wonders a bit at the expression of joyfulness in this remote and waterless desert.

– Ellisia membranacea Bth., no. 6629. cont. Corolla white; scales in tube not obvious as inconspicuous. But the remarkable feature is the ovary, seated on annular disk + glabrous save for 7 to 9 bristles with much dilated bases which occur on upper part of ovary and point inwards towards base of style. Style shortly 2-cleft. Calyx-lobes one with a remote but regular dilatation.

Coolgardie Yucca Mesa
c. 3560 ft.

No. 6631. Yucca brevifolia Engelm.
Flowers: 2 inches long; the outer segments narrower than the inner, mostly all thick fleshy. Stamens short erect, at apex with a spreading subglobose dilation, on the tip of which is the small anther turned downward. Stamens 1/2 length of pistil. Pistil narrowed at apex to the 3 small stigmas. Trunk bark dark brown, checked into small squarish plates 2 or 3 inches across.

The perianth segments shrink a great deal in drying, especially in breadth.

Yucca brevifolia Engelm.

	Circ.	Distance above ground.	Height	
No. 1.	13 ft.	1 ft.	24 ft.	Branch- into 4 branches at 4 ft.
No. 2.	6 10/12 ft.	1 ft.	18 ft.	Very dense foliage
No. 3.	7 2/12 ft.	1 ft.	24 ft.	Leaning tree
No. 4.	6 3/12 ft.	1 ft.	22 ft.	Very symmetrical
No. 5.	13 8/12 ft.	1 ft.	23 ft.	7 stems from 2 ft. of base.
No. 6	5 9/12 ft.	1 ft.	22 ft.	Senile or decaying tree
No. 7	11 5/12 ft.	1 ft.	27 ft.	4 stems from 3 1/2 ft.
No. 8	7 9/12 ft.	1 ft.	24 ft.	
No. 9	4 3/12 ft.	1 ft.	18 ft.	
No. 10	7 9/12 ft.	1 ft.	24 ft.	

Coolgardie Yucca Grove.
c. 3500 ft.

no. 11.	8 3/12 ft	1 ft	22 ft
no 12	9 ft	1 ft	23 ft

Finest trunks seen

Trees nos. 1 to 6 were photographed, as indicated in photo record, as nos. 1 to 6 of Spool no. 5. Nos. 11 + 12 were photo'd on no. 10 film of Spool no. 5.

The low shrubs as seen in the pictures are:

Larrea mexicana
Ephedra
Franseria dumosa
Lycium andersonii
Ambrosiaceæ Comp. with linear leaves
Grayia spinosa

No. 6632. Streptanthus (= Caulanthus) inflatus Greene.

Squaw Cabbage. A great delicacy to the miners in the Coolgardie district. Petals narrow, very undulate on both side the median band, white as slightly purplished tinged in the faintest way; 5 lines long; petals spreading rotately and little reaired at tip. Stamens 6, disposed in the usual way. Sepals strongly keeled in such a way as to make the flower in the bud strongly prismatic in the sense of re-entering angles. ↑ flowers When the buds are half-way to anthesis they have flat sides, that is they are 4-sided. Stigmas oval, very distinct; and also distinctive. This is a point of difference with typical Streptanthus I think. The inflated stems are almost polished, they are so very glabrous. The whole plant is glabrous, save for the somewhat

hairy pedicels, although a few short-scattered hairs can be noted on the very calyx and on the upper side of the leaves. Buds purple. The buds congested at the tip of the simple stem give an appearance of a condensed flower cluster and take the eye away from the flowers below this cluster which have been spaced a little by the growth of the stem and are comparatively inconspicuous. The plants are small, i.e. that is dry season ones. Only the leaves are used by the miners.

No. 6633. Dithyrea californica Harv.
Stems ascending from a central rosette. Flowers very sweet, white Calico wash, sandy soil. Stems very brittle, especially at the joints. Corolla white, tinged with light purple a very little, 8 lines broad, Petal blades 3-3½ lines long, oblong. Flowers 5 lines long. Sepals broadly closely connivent above, forming a closed tube. Cont. p. 91

No. 6634. Grayia spinosa See p. 97.
♂ and ♀. Male spikes commonly or I should have said mostly, 3/4 to 1 inch long but varying from 4 to 14 lines long, naked above, the lower part with a few leafy bracts. Calyx green or at first reddish; sepals 4, oblong, acute, barely 1 line long; stamens 4. Invariably 4-merous flowers as I observe them by lens.

— Dithyrea californica, No. 6633 cont: Ovary densely short hairy, crowned by summit- a large helmet-shaped stigma on an almost obsolete but still distinctly observable style. Stamens 6.

No. 6635. Menodora spinescens Gray.
Jack-thorn. Jim-thorn. Stigma terminal, obscurely 2-lobed, circular. Flowers 8 or 9 lines long. Corolla white inside, brownish-purplish tinged outside; its lobes round-ovate, 3 lines long. Corolla, stamens & style (over)

glabrous. Stamens 2, inserted in throat at summit of tube. The cor. has a distinct tube and distinct throat.

Calyx-lobes lanceolate, 5 + equal or when 6 or 7 more or less unequal.

Anthers connivent strongly by their edges, I'd say adnate, so as to form a tube about the style. The style with its terminal stigma pushes up thru this tube. The anther cells are laterally dehiscent, but outside the tube, so that there is on the anther column a longitudinal band of pollen on each side; so that self-pollination would appear impossible.

Shrubs 1/2 to 2 feet high, the stem stops upward growth, ending in a thorn, but develops short-lateral branchlets at right angles which bear stout thorns at right

angles and themselves end in thorns. These thorns are mostly white and make a very ugly barrier about the flowers which are developed behind their points. The first flower which I picked and examined had 2 good stamens and a third abortive stamen But as the flower was not cared, it seems likely now that my coarse field lens and my eye misled me. Anthers 2 normally. - From Second Summit, on road from Barstow to Superior Valley one has a great view of the wonderful ranges north, from Pilot Peak with a white band about his hat, as far as Telescope Peak. Why "Telescope"? It is a weird and weirdly alluring view, tantalizing the eyes to look and look, and study and study its multitude of mountains, hills and

formations. As we trot back to Second Summit there burst suddenly upon our eyes the grand series of wild ranges, lifting from Ord to Mt. San Jacinto, lifting up, up, and up from Stoddard's Peak to Mt. San Antonio and the high snowy crests of the San Bernardinos. But most awesome is the great gulf that yawns below us. The immensity and depth and almost awful space of the trough. I know of no other such trough to so impress the eye in California. One can see the Coast Ranges from high in the Sierras. but you get the idea of great flat plains in the Great Valley of the Sacramento and San Joaquin. Big to be sure but not awful; rather interesting or even deeply engaging like a

huge map spread before you. Looking across the basin of the North Fork of Tule River from Mt. Moses west is akin to this vantage spot here in the desert in stirring the imagination. But it is on a far smaller scale.

No. 6636. Lycium cooperi Gray.
Shrub, erect, rough, bark black; branchlets short and stubby; leaves oborate or lanceolate fascicled on the short fruit-like spurs at the side of the thorns. The appearance of the shrub is strongly suggestive of the wild Peach (Prunus fasciculatum) such as occurs on Ord Mt. Indeed, at first glance I mistook the bushes for that species. Flowers 1, 2 or 3 at each leaf cluster, ½ in. long. Corolla tubular, widened upward only a little, not as much relatively as the Water Jacket, No. 6612.

over

c. 3500 ft.

altho its tube absolutely is of much greater diameter. Calyx 3½ lines long, its lobes erect or little spreading, its lobes equalling tube in length. Corolla limb rotately spreading, its lobes short, 1½ to 2 lines long, the sides turned down in such a way as to give a horn-like effect to each lobe. This is a part of the regular anthesis and not due to wilting. Ovary glabrous, seated on a large red disk; style glabrous, ending in a terminal stigma which is circular, green, and very obscurely 2-lobed. I think one would not notice it as 2-lobed save but for the fact that it ought to be 2-lobed by virtue of its relationship. Stamens with anthers at mouth of tube, the filaments hairy from point of adnation down which is about half-way down tube. Corolla greenish-white! There was a good deal of this species scattered

over the whole mesa.

- Shrubs of the Coolgardie Mesa.

Larrea mexicana, not a great deal.

Franseria dumosa

Lycium andersonii Gray. Water-Jacket. Abundant.

Thamnosma montana. Turpentine Broom. (8 to 28 in. h.)

Hymenoclea salsola T. & G. Ambrosiaceous Composite with linear leaves.

Grayia spinosa = polygaloides? Validate by 6634.

Eurotia lanata

Lycium cooperi, no 6636

No. 6637. Thamnosma montana Torr. & Frem.

Fruits. Capsules regularly dehiscing by a lateral slit across the top of each cell, that is a slit running from the base of the style or apex of the capsule or placental axis, at right angles to the commissure of the two cells, but only extending across top of cell.

No. 6638.

Lichen. On rock. Second Summit. These two lichens color whole rock piles or great rocks.

No. 6639.

Lichen. On rock. Second Summit.

No. 6640. Lycium torreyi Gray. Of the river bottoms. To 6 ft. h. Corolla purple-lavender, fading dull or rather sordid yellow. Flowers ½ inch long. Corolla strictly tubular, but morphologically composed of a tube proper and a narrow throat, the stamens being situate at base of throat + on down, the filaments free in the throat. Stamens glabrous save for a little flocculence at point of insertion of filaments. Corolla glabrous, its lobes 5, often 6, lanceolate but bluntish at tip; these lobes are really tapering from base to blunt apex and rather broad, broad enought to be called narrowly oblong-ovate, but the sides curved down, a little after the fashion of Lycium cooperi No. 6636, so that the appearance in the

flower in full anthesis is of 5 rotately spreading or somewhat recurving lanceolate lobes 1½ lines long. Diameter limb = 4½ to 5 lines. Flowers in a cluster, 5, 2, 3, 4, 6, 7. Calyx 1 to 1½ lines long, its teeth strictly erect. Flowers in a cluster run mostly 3 to 5. Pedicels 4 to 5 lines long, pretty slender. Stamens conspicuously exserted. Corolla fading promptly.

— Lycium pallidum Miers. Rabbit Thorn. (Nos. 6606, 6614, 6618). Corolla is very variable in color. The bushes with the white flowers on pendulous pedicels on the under side of their thorny spreading branches are really very attractive. There is a certain delicacy in the case of the very white ones almost suggestive of fruit blossoms. But "delicacy" is not the word, — it is the pure freshness of spring. and then there are shades from lavender to purple (Cont. p. 104)

Table of the Lycium spp. *

–Water Jacket, No. 6612.
Densely leafy shrub.
= L. andersonii, acc. Parish
Gray in litt. 4/27/16.

–Squaw Thorn, No. 6640.
More sparingly thorny than the others
Pedicels ½ inch long, more exactly
4 to 6 lines long.
= L. torreyi Gray acc. Parish.

–Rabbit Thorn, No. 6606, 6614, 6617, 6618
6641. Not very leafy but a form of it very densely leafy like a fir branch.
?= L. pallidum Miers acc. Parish.
Trumpet Thorn acc. Miss Waterman
in litt. 31 May 1916.

–Peach Thorn, No. 6636, 6701.
Very very densely leafy with leaf
rosettes or clusters.
= L. cooperi Gray acc. Parish.

* See further notes 27:35.

Corolla campanulate

Rabbit-Thorn
L. pallidum.

Corolla tubular

Stamens exserted; corolla narrow-tubular; bark light-colored or whitish.
Corolla purple; fls 3-7... Squaw-Thorn
L. torreyi
Corolla very pale lavender; fls 1-2... Water-Jacket.
L. andersonii.

Stamens included; corolla broad-tubular; bark black

Peach-Thorn
L. cooperi

Corolla strictly tubular; its lobes long

Squaw Thorn.
L. torreyi

Corolla with a distinct throat at top of tube; its lobes very short.

Water-Jacket.
L. andersonii

– over –

Barstow

Lycium

Corolla not twice length of calyx; nearly stamens included; stigma capitular, green, a little peltate as it were, borne within low

Peach Thorn.
L. cooperi

Corolla twice length of calyx; over stamens exserted; stigma greenish, transversely oblong, exserted.

Rabbit Thorn.
L. pallidum.

Stamens exserted or mainly so.

Corolla campanulate, pink to white!

Rabbit Thorn.
L. pallidum

Corolla tubular

Throat obvious; corolla dull white, fading ruchestin... Water-Jacket.
L. andersonii

Throat none; corolla lavender-purple, fading yellow.. Squaw Thorn
L. torreyi

Stamens strictly included in tube; corolla dull white

Peach Thorn
L. cooperi.

No. 6641. Lycium pallidum Miers. Rabbit Thorn. "Berries" large even at this time, as much as ½ inch diam. Foliage comparatively scattered.

No. 6642 Lycium pallidum Miers. More densely leafy than 6641. Berries the same apparently but smaller, at this stage anyway.

(See note of abundance or desert and its general appearance in bk. with spm.)

No. 6643. Lycium pallidum Miers Apparently same as 6642 but very densely leafy like a bi branch! ?Var of 6641.

Cont. from p. 99.
with some bushes showing parti-colored flowers — deep lavender or red-purple with a white band or spot at the sinuses of the corolla.

No. 6644. Lycium pallidum Miers.
Non-flowering plants often bear very large leaves as shown here. Sometimes seen, especially early in season, on flowering plants.

No. 6645. Rumex hymenosepalus.
Barstow, Mar. 26. Flowering stems cut off at, or nearly at, the ground.
See No. 6627

No. 6646. L
Lichen. With 6639 and joining in the same color effects on large rocks.

— A horse in snowshoes is making its way as the "Snowshoe Horse" across the Sierra Nevada in the deep snow. It is accounted a great feat even in this day. See S.F. Chronicle for Feb. 10, 1916. Think therefore of the feat of Fremont in midwinter, 1844 or was it '45?

— How finely Calico lifts as one pulls up into the Cajon Pass! It shows as the great landmark from Hesperia way and above. Above Hesperia near the summit the Juniperus californica comes in. The shrubs run from 4 to 9 ft. h., and are often as broad or broader than tall, especially those from 4 to 6 feet. high. Down into the canon of Cajon Pass on the southerly slope the chamise mountain sides are blue with the flowers of Ceanothus divaricatus Nutt.

On the higher desert slopes, Hesperia side of the summit, Yucca brevifolia stood very thickly in young stands. In the early morning light as seen from the train there new stands

in a small spot here and there looked as if growing up from the ruin area of an old parent tree.

The Cajon Pass is a fine pass and I should never be tired of going through it, it seems to me.

– H.H. Brandes, Santa Barbara, has an exhibition of Redwood panels, all of a great variety of pastel colors, which look very curious. They are due to acid stains, or rather made by

– The Exposition was a disappointment; unless perhaps for persons who seek merely to be amused. A number of the buildings were good, but there were awful conflicts in architecture here and there, & in color as well. Utah, I think it was, had the letters, announcing the State name on the front, yards high it seemed; and so bald. The grounds arrangement lacked the simplicity and harmony of the San Francisco effort; but the planting of trees and shrubs and the filling of the barrancas with them is excellent, most

excellent.

Botanized out over the mesa towards mouth of San Diego River and around into Old Town. One of the two old Palms planted by Serra below the hill on which now stands the Serra Cross is still standing, say 90 feet tall, but is held erect by cables, its companion tho' not so tall, having been blown over in a windstorm. Then to Old Town, the old plaza, on which fronts Governor Estudillo's old adobe mansion. They have a beautiful garden inside, filling the patio, and many old relics of Mexican and early Californian days.

[– Went to call upon Daniel Cleveland and had a pleasant talk with him; but apparently I made no record of it at the time.]

San Diego

Mesas 50 ft.

No. 6647. Cardionema ramosissimum (Weinm.) Nels & Macbr.

Stamens 5, 4.3, alternating with the 5 ovate scales in the base of the calyx. When the stamens are 3 the arrangement is: 2 scales, 1 stamen, 1 scale, 1 stamen, 2 scales, 1 stamen. Style very short but evident, the 2 stigmas a trifle longer. Or it may be the style is 2-branched and the branches stigmatic altho I hardly think so. The flowers are shunned with fine sand dust so that a careful record in the field of their very minute structure is not easy. Flat on ground.

No. 6648. Orthocarpus densiflorus Sacs white with a purple dot on the inner side of each lateral fold ("the eyes of the owl"), the galea scarcely longer than the sacs, only slightly hairy, the hairs shorter than the galea is broad. Filaments naked!

Part of this collection has been segregated by D.D. Keck as var. gracilis Keck. See the segregate as no. 21,375.

No. 6649. Orthocarpus purpurascens Benth. Sacs red-purple with a white transverse band at top, bordered on its upper edge with a small yellow area forming a small field for 5 purple dots. Galea much longer than the sacs, densely hairy, the purple hairs longer than the galea is broad. The red sacs have purple spots just below the white band

spoken of above, and the white band, as anthesis passes, fades light red.

No. 6650. Rhus integrifolia B. & W.
Sepals and oval petals ciliate; stamens 5, included, the filaments rising from bays or small sinuses in the red disk. Petals a little hairy on upper side. Styles 3, closely erect, distinct or nearly. Taken from a shrub 3 ft. h. and 6 ft. broad. I observe it elsewhere up to 12 feet high and distinct trunks, tho several of them.

No. 6651. Platystemon californicus. Petals often with a yellow. Not different from species at San Francisco.

No. 6652.
Involucre scabrous - hispidulose and glandular

No. 6653.
Involucre slightly pubescent, neither scabrous nor glandular.

No. 6654. (Discarded, insect damaged) Encelia californica Nutt.
Rays: 17, 20, 18.
Shrubs 3 to 4 ft. h, the heads terminating leafy stems of the season 12 to 16 inches long there leafy peduncles or shoots almost always monocephalous. This species is one of the truly showy things hereabouts, coloring whole slopes of barrancas.

San Diego 50 ft.

Mimulus longiflorus (Nutt.) Grant × Mimulus puniceus (Nutt.) Steud. Det: A.L.G.

No. 6655. Diplacus puniceus

Lower lobes somewhat squarish, dentate a little on apical edge. upper lobes or ears earmarked or notched laterally, the lobes erect. Stigmas small, white Style with minute spreading gland-tipped hairs. Corolla pretty uniformly dark red. Erect shrub 1½ to 5½ feet high.

(Linanthus dianthiflorus Greene. — Endl.

No. 6656. ~~Gilia dianthoides~~

Corolla, as opening, a most beautiful bright pink, the bare of lobes white; throat yellow, the bottom of throat or top of tube purple. Stamens included in tube. Stigmas 3, long (1½ lines) and slender, twisted corkscrew wise, and when spreading horizontally still corkscrew

wise individually. This twisting may have subgeneric significance. Compare other species. Corolla pink with white eye makes the folk-name explainable.

See p. 117.

Ground Pink

No. 6657. Salvia mellifera Greene.

Black Sage. Shrub 5 ft. h., 8 ft. broad. Corolla pure white, the slightly notched rounded upper lip erect in line of tube or bent back very slightly or inappreciably. Lower lip widely spreading downward, nearly twice as long as upper, the lateral lobes truncate, the middle lobe small, developed into a broad appendage, notched at apex a little. This appendage is broader than the main portion of the lower lip below the appendage, a little broader. Stamens borne under upper lip, the style longer, the

two lobes unequal, the lower twice as long as the upper.

(Nemophila menziesii H. & A. var. integrifolia Parish.)

v No. 6658. Nemophila rotata Eastw.

Corolla 4 lines diameter, deeply-lobed, the general effect saucer-shaped; lobes notched a little at apex as to spreading of lobes a rallié, distinctly emarginate. Scales on base of petals (as separated by tearing) a bunch or bunches of fimbriated scales, so fimbriated as to be hairs. Ovary densely hairy with up-pointed straight hairs.

No. 6658a. Bowlesia lobata

Cult. no. 6659. But more of the color by far is kept there in case of no. 6752 from Tehachapi.

v no. 6659. Mirabilis

Calyx most beautiful, bright rose-purple with darker purple throat. Stamens exserted; anthers yellow. Lobes of calyx notched. Calyx 9 lines diam.. The base or tube seems as if seated on the top of a globose inferior ovary; but this really an uncolored calyx base, globose and jointed by a constriction to the calyx tube proper. The globose character makes it fit the ovary exactly. Stamens and style and ovary glab. Calyces change purple or almost indigo on drying to dark See p. 116. also shrivel badly.

- Gilia diantholdes, no. 6656. Corollas change to purple-lavender in drying. See p. 114

No. 6660. Sisyrinchium bellum. Wats.
I see no difference between this and the Bay region plant. It grows on the same kind of hills & soils. Perianth 8–11 lines broad; segments notched at apex with a spear point in the notch, 3- or 4-veined. Perianth blue with yellow eye. Surely this must be quite the same thing as at Berkeley. The shades of blue are the same, and the fading colors, and the details of structure.

No. 6660 a. Sisyrinchium bellum. Flowers, only; (coll. at La Mesa, Apr. 3.)

No. 6661. Plantago
Dry mesas.

No. 6662. Trifolium tridentatum Torrd.
Mesas.

No. 6663. Tillaea ~~minima Miers~~ = T. erecta H. & A.
Dry mesas

No. 6664. Sanicula arguta Greene.
Dry mesas.

No. 6665. Trifolium amplectens var. truncatum T. & G.
Dry mesas

No. 6666. not Anisinckia Douglasiana H.D.C. Det. McBride
Cañon sides. = A. intermedia F. & M.

San Diego (Trip to San Diego River and Old Mission) 20 ft.

No. 6667 Layia platyglossa ssp campestris Keck. Rays 13, 13, 13, 12. ; deep yellow with white tips. See p. 123 — Adobe flats in cracked soil. After I had counted the rays on 3 heads there cracked in my mind remembrance of Tracy's criticism of the diagnosis in Fl. W. Mid. bal "rays 13", that the rays were more and less and that 13 was an unlucky number for the diagnostic accuracy of that description! Still they seem to vary about 13. — Old Town, Apr. 2. Mission San Diego.

No. 6668 Urtica urens L. Old Mission Garden.

No. 6669. Allocarya acanthocarpa Piper. Dry mesas.

No. 6670. Arctostaphylos bicolor Gray. Three feet high, bushy, erect thrub. Berries apple: red. Sides of barranca. Up to 6 ft. high! Often with distinct trunk. Bark scarcely at all like typical manzanita species. See p. 124.

— Three harvesters are just to begin work harvesting kelp on the San Diego coast, capacity two tons per hour. The kelp is cut by knives, brought up, and "pulverized" by knives. The promoters are the Hercules Powder Company of Wilmington, Del., and the Swift Packing Co. of Chicago. — San Diego Sun, Apr. 3, 1916.

No. 6671. Convolvulus occidentalis Gray. Over bushes everywhere.

No. 6672. Microseris Dry mesas.

No. 6673. Ceanothus ~~crassifolius~~ verrucosus Nutt. ~~verrucosus~~ Up to 8 feet high. Sides of barranca = C. verrucosus Nutt.!

No. 6674. Psilocarphus brevissimus Nutt. Pool beds on mesas.

— Brush on sides barranca, San Diego River: 3 – 6 feet h. mostly: — Ceanothus verrucosus Nutt. Black Sage (Salvia mellifera Jepson). Arctostaphylos polifolia (No. 6670).

No. 6675. Tillaea erecta H. & A. Pool beds, dry mesas

No. 6676. Trifolium amplectens T. & G. var. truncatum Dry mesas.

Near San Diego
530 ft.

No. 6677. Minilla maritima-Nats.
Perianth dull white, 4 lines broad; outer segments oblong (the sides recurved) ending in a back curved tip covered on the upper side with a dense mat of short closely packed hairs like a Calochortus gland on a minute scale; inner segments elliptic, drawn down to apex a bit. Ovary crests inconspicuous, rounded. Dry flats on mesas.

No. 6678. Downingia
Corolla light blue with a quadrilateral white field in center lower lip and yellow heart spot on inner side of that, upper lobes narrow-ovate, acutish, spreading

horizontally backwards or recurving. Lower lip spreading (a little above the horizontal). All these directions are with reference to the tube. Anther column 2-muticous, its summit at mouth of corolla tube but not exserted. The circular stigma pushes through the anther-tube a little later and it curves from above so as to stand in entrance of corolla tube but neither can it be said to be exserted, properly. Corolla lobes very broad and rounded, apiculate. Corolla lower lip 6 to 7 lines broad.

- Layia platyglossa, no. 6667; rays conspicuous in fresh heads, shrivel badly in drying.

530 ft.

No. 6679 Allium haematochiton Wats.
Ovary white with 3 dark red didymoid crests, low cock's comb. Perianth like a very distinct but a stamen on base of each and the stamen bases united by a sort of annular tissue. Perianth white, with purplish markings towards base of segments, 5 lines broad. Segments with brown mid-vein, ovate, acute.

No. 6680. Oxalis ~~corniculata L., not O.~~ pilosa Nutt. ~~wrightii Gray.~~
Corolla 6 lines diam., yellow with reddish pencilings in eye; petals truncatish or sometimes slightly retuse.

– Arctostaphylos bicolor (Nutt.) No. 6670. Leaves curl badly in drying

No. 6681. Viola pedunculata T. & G.
Lower petal largest, rhomboidal with the short sides towards apex where it is broadest, apiculate, purplish markings at base, there repeated on a small scale on lateral petals upper petals without markings. Corolla yellow, with the effect of a purplish eye. Lower petal somewhat spurred at base.

No. 6682. Nucroseris heterocarpa
Dry hard soil, mesas.

No. 6683. Spergularia clevelandi
Dry hard soil.

— Rhus laurina. Large many-stemmed shrub 2 to 8 ft. h. Stems mostly simple below and branched above. Effect of foliage dark, now, lightened by the blood-red or scarlet shoots just appearing. Bark dark brown.

No. 6684. Eleocharis montana R.&S. Wet bottom near stream.

No. 6685. Dichelostemma pulchellum Brodiaea capitata Benth.

No. 6686. Baccharis sarothroides. The old leaf bunches make the bushes look like Casuarina shrubs. The foliage of the shrub is very "punchy". The shrubs are 5 to

7 feet tall, and rather shaggy. They are quite striking; in stream bottom near La Mesa.

No. 6687. Baccharis viminea DC. 4 to 8 ft. high. Stream bottom.

No. 6688. Dodecatheon Clevelandi Greene.

No. 6689. Cryptantha intermedia Greene. Dry mesas.

No. 6690. Plagiobothrys nothofulvus Gray. Dry mesas.

No. 6691. Juncus bufonius L. Low place on mesa

No. 6692. Dry mesas.

No. 6693. Lotus strigosus Greene Dry mesas.

50 ft.

— Botanized over the mesa towards San Diego River, went down into Mission Valley and across the river to the old Mission San Diego of which ruins a substantial portion of the front, only, remains. The extensive lines of the old foundations show still something of the size of the establishment on the little hills above the river bench or bottom. On the river bottom are still to be seen, in spite of periodical high floods, old adobe foundation walls that indicate the further extent of the Mission village. Most interesting is the old olive orchard. The trees are over a century old and look it. They are about 20 to 25 feet high, roughly judged. No care is given the ruins. Two of the

apartments next south of the church front are in tolerable preservation, having been covered in more recent years with a shingle roof; but even these rooms are used as a winter shelter for cattle. The early Franciscans had a secret tunnel running from the church down to the first bench of the river. Its lower end may still be seen. By this tunnel some of the friars made their escape at the time of one of the earliest and severest Indian attacks. There are some relics of the Mission kept in the Indian schoolhouse. In particular a large and not bad painting of a saint whose name I forget. The picture shows where Indian arrows passed thru the canvas; it dates back to the earliest days of the Mission San Diego and was doubtless brought from Old Spain.

– In botanizing it is important for collecting to avoid roads and cut across country. But in returning from the Mission San Diego to San Diego it was necessary to follow the county road for some three hundred yards and I thus lost my incognito. An automobile load of people was startled to have their machine called to an instant stop by one of their number, who sprang out and greeted me with all the excitement of one discovering King Alfred come to life again. And so the next day the telephone bell at my hotel kept ringing from various of my students in San Diego who wanted to express in some way their respect and affection. Their loyalty and friendliness was very affecting to me, removed as I have been for over

a year from personal contact with my students. It was like warm sunshine; it was like wine, like the scent of the wildgrape in the June-time bloom.

– Eschscholtzia californica. I found this nowhere in my walks about San Diego.

– Ethel-Bailey-Higgins, El Centro, has a most beautiful exhibit of pictures of the California wild flowers of Southern California mostly. They are photographs colored with great delicacy and taste and judgment.

– The train to Los Angeles skirts the ocean, crosses San Dieguito River and San Luis Rey River, the latter a considerable stream just north of Oceanside. Leaves the ocean at San Juan Creek and passes the old Mission San Juan Capistrano. I go on to San Bernardino and thence to Barstow.

– Before Christmas I received a letter from a former student, who fresh from enthusiasms stirred by the Sierran trees, wrote to tell me of her great indebtedness to me for the world I had opened to her. This is Margaret Hazar, now Mrs. Best, who writes again to tell of continuing companionship with the trees by going to Golden Gate Park. "I am out in the Park so often I simply gloat over the fact of such a variety of trees for my enjoyment, that I may see them so much. These days of clear air after rain are fine for admiring treetops against the sky. But I feel so densely ignorant. There is so much I do not know. If someone could only tell me where those cypresses end and Thujas begin, how much happier I should be!"

I have said to myself many

times. I never shall learn it by myself. It's too difficult to get the details out of a book. xxx If perhaps the knowledge will not die with me You know what a teacher I am."

I told her the difference between the two genera, expressed my great appreciation of her loyalty and added: You letter revives certain thoughts in my mind; – thoughts which I have long indulged. Before California can come into the perfect flower of civilization there must be at least a general diffusion of the fine arts and sciences. For myself I am trying to do a little for Botany in behalf of California; but I can never attain to anything like measurable success without the aid of those of my students who are prepared to help. You can do your bit by studying thoroughly the trees in

the Park. It is wonderful how clearly told and interesting facts pass along by word of mouth from person to person. You have been trained to do such work. You have ability and you are also clever and quick. But if you run back to me for elementary facts instead of now doing them for yourself, you might as well have come from a trade school and not a University; for there lies an essential difference between the two.

Of course you would be free to come to me for help with your problems — but for the purpose of learning to work independently, to increase and consolidate your powers. And I would always welcome you. (Cf. Margaret Best, in litt. Jan. 20, 1916.

- Burrough, John, is author of a book: "Camping and Tramping with Roosevelt" It were better, Roosevelt's "Camping and Tramping with Burroughs".

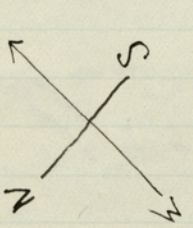
- Yosemite. A list of plants in, Lester, J. E., The Atlantic to the Pacific; What to see and how to see it. 365 pp. Boston, 1873
- Sequoia gigantea. Cf. N. W. Griswold, "Beauties of Calif." S. F. 1884.

- T. W. Adams, Greendale, Canterbury, N. Z., says: Dr. Perez of Teneriffe recommends clearing [oak] seeds and then immersing them in boiling water for ten seconds to secure early germination.

– Yucca brevifolia:– See bottom p. 137 for explanation.

7 ft ½ in. ⊙

4 ft 7½ in. ⊙



⊙ 4 ft 8¾ in.

⊙ 4 ft 5 in.

⊙ 5 ft 10 in.

⊙ 6 ft. 5¾ in.

– Yucca brevifolia:– See bottom of page.

Old Yucca tree. On west side 2 limbs wired:

a. End of leaves in direct line 2 ft 2¼ in. from wire knot on top side, measuring to bud in direct line, on that side.

b. End of leaves 1 ft 2½ inches from knot in wire, measured on under side

Tree about 350 yards south of group of young ones measured and recorded on p. 136.

P. 136. Yucca brevifolia. Young trees wired at or near ground and measured to top of simple stem. The measurement indicated gives the distance from the knot in the wire to the tip of the upstanding leaves. The point where one turns off the road northerly is marked by a blaze on

Coolgardie Yucca Mesa
Calico Mts.

a Yucca trunk, left-hand side of road going out, and about 3/4 mile from signpost. The marked trees are on right hand side. The old Yucca of p. 137, is blazed and lies beyond the young group of p. 136, a smaller tree in the line of them being blazed as a guide to it.

Miss Waterman drove me out behind the blacks and helped me to make the measurements of the Yuccas.

v No. 6695. Grayia spinosa Moq.
Hop *Sage. About 3 ft. high. The shrubs are fine sights now in their loads of fruit which is red-purple and a brave sight, before it becomes straw-white.

v No. 6696. Nama dercissum Gray.
Red-purple; flat in ground when branching. Making red-purple carpets on the flats in Calico Wash. sandy

I prefer to call this corolla bright red - a most delightful bright red. but color sharps would say it was of the purple series I suppose. Corolla 5 lines long, funnelform, ~~with~~ broad limb (6 to 7 lines broad). Lower part of tube yellow, i.e. whole of true tube, at top of which stamens are inserted. unequal

* The fruits are wonderfully like hops says Miss Waterman.

Coolgardie Yucca Mesa

Calico Mts.

No. 6697. Dalea saundersii Parish (see p. 141).

Shrub 3 to 4 feet high. Its petals is the royal purple, like the finest color of the Royal Larkspur (Delphinium variegatum). It is or is almost indigo. It is one of the finest colors I know.

Its odor is a characteristic desert odor — aromatic turpentine kind of odor — heavy but with something of stinging incense. Banner notched. Wings a trifle shorter than keel, not notched or only very rarely as a mere variation. Lower calyx tooth, opposite banner, slender, recurving or at first spreading, the lateral broad short, erect, the upper broad short, closely approximate the sinus bolded

e. 3000 ft. Apr. 9, 1916.

them has a sort of flat blunt spur. = Parosela fremontii Vail var. saundersii Mcbr.

No. 6698. Astragalus layneae Greene.

Flowers 8 to 8½ lines long. Calyx 5 lines long with short but slender teeth. Banner dull white, with purple lines in center. Wings blunt, exceeding keel a little, practically as long as banner. Wings and keel purple on their upper parts. dark

All parts of the corolla, stamens and pistil glabrous. Stamens 9 and 1, the free filaments of the 9 very short, just the curved portion at the top of the united sheath, shorter than I have ever noticed before. Sides of banner turned sharply back, the tip of the banner with a light blue spot. — Calico Wash.

Coolgardie Yucca Mesa

Calico Mts

No. 6699. Tetradymia stenolepis Greene. Its needles are deadly stings and the longest and most slender of any spine on the desert that I know. Needle-Bush might well do as a common name. Shrub 20 to 24 in. h.

~~Streptanthus inflatus Greene~~

No. 6700. Caulanthus inflatus Wats. Always in colonies in richer sandy spots on the mesa; often forms a spot east of a Creosote or other bush. Colonies 3 to 8 or 12 feet diameter. Small therefore. Second Summit.

No. 6701. Lycium cooperi Gray. 3 to 3 1/2 feet high. The corolla lobes are recurving! only at first rotate. The shrubs

Apr. 9, 1916

San Bernardino Co

are very floriferous; the corollas appearing in great numbers on the under side of the branches. I count 38 flowers within the space of 2 inches on a branchlet, the terminal portion! Most of these flowers were in full anthesis — only a few in bud.

= Streptanthella

No. 6702. Streptanthus longirostris Wats.

Calico Wash. Flowers 2 to 2 1/4 lines long, very promptly reflexed. Petals: Blades very very short, less in breadth than summit of the upwardly expanded claw. The yellow petal blades hardly seem pale to expand at all. Thelypodium longirostris Jepson in Fl. Cal.

Coolgardie Yucca Mesa.

Calico Mts.

No. 6703. Caulya candida, Parry.

Rich sandy soil Calico Wash.

Flowers in a close bunch. Corolla pure white, 1/2 lines broad. Stamens 6. Stigmas 3, linear, radiating downwards over surface of ovary — Calico Wash.

No. 6704. Sphaeralcea exilis (Gray) Greene = ~~Sphaeralcea~~ exilis (Gray) Jepson.

When this thing comes up on the sandy mesas and flats in the late winter one feels, looking at the earliest leaves, that it must be a Ranunculus. Only of course one knows there is no buttercup on the mesas. Finally it reveals itself by its flower as Malvaceous. — Calico Wash.

Corolla white, very small, 2 1/2 lines diam. 2 1/2 lines long. Petals round. Calyx-lobes lanceolate, (Flowers) exceeding corolla. Bracts filiform, 3, shorter than corolla. See next p.

No. 6705. Pectocarya linearis DC.

Calico Wash, n. of Daggett.

Cont. of 6704. Stamens apparently not more than 12 or 15, about 2/3 length of corolla. Styles apparently 9 (or 10).

— Branches of Cottonwood (Populus Fremonti) thrown over the fence into the corrals, — windfall branches, — are eagerly attacked by horses and cows. They first take the leaves, then the bark, leaving the skinned branches shining white on the ground. I noticed some gobbling up the fallen clusters of Cottonwood capsules, which looked, half-grown, not unlike Gooseberry racemes. Hogs, cattle, horses, — all eagerly Browse Atriplex torreyi, microcarpa and confertifolia after their winter in the alfalfa pastures.

Barstow 2100 ft.

No. 6706. Prosopis pubescens.
Sections of the wood. – Jan. 1916.

No. 6707. Oenothera
The dried stems curl in from the base and form a roundish basket at the top. These baskets are often very perfect. – 12 Mar.
Down river near Cumpston's Ranch. Whole plants rooted where they grew in flowering.

See No 6613 Oenothera.

No. 6708. ~~Oenothera~~
Very abundant on the mesas, its flowering the most conspicuous of any annual at this time, coloring broad spots on the sandy mesas and in the washes.

– Mrs. G. F. Grant writes from Columbia to say she has an Anemone she can't place in the Flora of California and "does not any Flora contain all our anemones"? I reply: "It is not at all unlikely that your Anemone is new or new to California. New things will be found here for centuries. The greatest purpose of any Flora is to stimulate work and interest in our wonderful vegetation. If the subject could be exhausted in a book then all would henceforth be dead and dry. Shakespeare nor Milton nor Darwin exhausted anything or completed anything. They only started living fires which will burn as long as the race shall last."
– Rained rather heavily today.

— Lepidium fremontii. Very very floriferous. One of the most, if not the most floriferous of desert shrubs. Roundish bush, 1½ to 2 or 3 feet high.

— Cassia armata. Just coming into flower. The flowers have a lovely delicate odor which revives somewhat old-time memories of Little Oak Ranch. Perhaps it is the odor of bruised peach wood. In any event it has something to do with a peach.* The bushes are 2 to 3 feet high and roundish, full of old dead stems which gives the heart of the bush a black appearance. The flowers the color of broom of the gardens.

* Perhaps better, it is the odor of Wild Rose. It just is a very illusive odor and recalls memories anyway.

(Discarded, insect damaged)
No. 6709. Hymenoclea salsola T. & G. Spreading bush 2-3 feet high. Female flowers have apparently but one stigma. In the washes. Common.

No. 6709a Cryptantha nevadensis Nels. & Kenn.

— The half-mile high rich spot ten miles more or less west of Kramer is heavy with bloom. It makes me long to be on the ground instead of on a limited train. Further along Saltbush Scrub and Mohave the yellow stretches of flowers with rare spots of yellow sand and gray saltbush makes combinations of colors on the flats which are lovely bits.

Going up into Tehachapi Pass I notice in the lower cañon on the desert side Lepidium fremonti, Juniperus californica, Yucca brevifolia, and further, at a point about 5 or 6 miles below the Tehachapi Cement Works by which I mean the Cement Works in lower Tehachapi Valley the wash of the cañon (cont. p. 176) is striking because of a colony of Tamarix indica. It forms circular patches, 6–8 feet high and twice as broad; now in full flower.

While I have been over Tehachapi Pass a good many times I never got a good idea of the pass from the train windows. Tehachapi Valley is really on top the range. One runs thru it northerly and into low hills at its upper end where the eye is delighted with the great valley oaks, in the narrow valley bottoms and on the low hillsides, truly large trees the first one sees, and truly healing to eyes sick-weary for trees. The train passes quickly thru these little hills and without any apparent ascent one soon notices that we are on the headwaters of a stream flowing into the San Joaquin Valley.

Woodford is the first considerable station below the loop. It is a village and has the Keene Hotel. The Postoffice is named Keene.

– Got off at a station, Rowen, or siding seven miles above Caliente thru the courtesy of the conductor of the limited who was much interested in my botanizing and said it was the finest time of the year for flowers. All the slopes are in the first full flush of spring flowering. The banners of pink, yellow and blue stretch out over the opens between the oaks. I was thrilled by the riotous abundance and by the familiar faces of so many flowers characteristic of the Great Bowl of California

No. 6710. Babria
Colors the hillsides

No. 6711. Gilia acicularis (Greene).
Colors small areas. Cited as Linanthus bicolor (Nutt.) Greene in Fl. Cal.

No. 6712. Saincula bipinnatifida Dougl.
Flowers deep purple

Kern Co.

No. 6713. Amsinckia Eastwoodiae Mc.B. Det. McBride

No. 6714. Athysanus pusillus Greene.

No. 6715. ~~Platystemon~~ Meconella linearis
Small but exactly like the usual form. With yellowish tips to the petals.

No. 6716. Solanum xanti Gray.
Stems woody at very base only i.e., at surface of ground. Stickier than the Berkeley S. umbelliferum and looks different, but the distinctive difference not obvious offhand. Stems show full height of plant. Rather dark blue corolla

Rowen.
2300 ft.

No. 6717. Astragalus didymocarpus H. & A.
Middle portion of corolla (up & down) whitish, rest purplish and veined. Banner emarginate, longer than wings which in turn exceed keel. Wings 2/3 length of banner.

No. 6718. Astragalus nigrescens Nutt.
Like preceding in its flower. Probably a small form with a reduced inflorescence.
= A. gambellianus Sheld.

No. 6719. Gilia tricolor Bth. var. longipedicellata Greenm.
I never collect this but that I think by how little it missed

being true Gilia tricolor. Colors wide stretches of hill slope. (- However, by its one character it is a fairly good variety. - 1939, Apr.).

~~(Hel. var. opimus C. P. Sm.~~

No. 6720. Lupinus benthami Det. C. P. Smith.
Flower blue with central white spot to banner. I distinguish no difference in corolla between this and L. nanus. Upper calyx teeth lanceolate, very divergent; lower lobe very shortly 3-toothed or 3-dentate and covered with long stiff hairs as if spiny! upper lobe similarly hairy. White spot on banner turning red purple. Corolla including keel glabrous. Colors patches (2 to 6 acres) on bare south west slopes in oak country.

Tehachapi Mts 2300 ft. Rowan.

No. 6721. Lotus strigosus Greene. Banner brown - flower yellow, the wings and keel deeper yellow; wings less than ½ length of banner, nearly twice length keel. Wings spoon-shaped, connivent by their edges. Relative lengths are exclusive of claws. Banner reddish-brown on back.

No. 6722. Plagiobothrys tenellus Gray. Rather dry, open hillsides.

No. 6723. Orthocarpus purpurascens Benth. Moist grassy slopes

No. 6724. Trifolium Leaflets very slender. With 6723.

The trees are:

Quercus wislizeni!
Platanus racemosa
Populus fremontii.
Quercus douglasii
Pinus sabiniana
Aesculus californica

No. 6725. Orthocarpus attenuatus Gray. With 6724.

No. 6726. Lithophragma parviflora Nutt. Leaves palmately divided into slender divisions. Calyx with clavate tube proper and somewhat enlarged throat above that, the whole narrow-turbinate. Petals deeply 3-cleft into slender divisions, the middle lobe largest. Corolla with strictly rotate petals, 7-8 lines broad. Moist rocky cliff.

Tehachapi Mts. 2300 ft. Rowan.

Apr. 14, 1916 Kern Co.

No. 6727. Lithophragma bolanderi Bol. Lowest leaves merely notched or slightly lobed. Calyx-tube with flat or bowl-shaped base, narrowed upward a bit or somewhat urn-shaped. Corolla with entire petals, 5 to 6 lines broad; petals more or less ungual and the blades nearly or exactly a little ascending and not really rotate. The previous species has a very flat corolla in bot. With 6726.

(= Lithophragma heterophylla T. & G.)

No. 6728. Brodiaea Dichelostemma pulchellum capitata Benth. With 6724.

No. 6729. Sanicula bipinnatifida Dougl. With 6724. Same station as 6712.

No. 6730 Phacelia hispida Gray var. cicutaria Mebr. Corolla dull white. Filaments with wings attached to each side and produced above into a lacerate border so that the stamen appears to set in a little sac, but the filament is free only a short way down. Ovary with long erect stiffish hairs or bristles; lower part of style hairy. Corolla with small brown dots or blotches as if the corolla were sessile or aged in depressed spots. Rocky shoulder. Annual, at least apparently.

No. 6731. Pectocarya penicillata DC. (A.) Dry hillslope.

No. 6732. Arenaria californica (Gray) Brew. Dry hillslope.

No. 6733. Plagiobothrys nothofulvus Gray With 6731.

No. 6734. Astragalus pachypus Greene. Banner longer than the very narrow wings and keel, sharply recurved deeply notched at apex. Corolla pure white, soon becoming scarid. Calyx teeth slender - lanceolate, equal. Woody at base only, 16 to 30 inches high, very bushy.

No. 6735. Isomeris arborea Nutt. var. globosa Cov. Bladder pods full grown in size. Receptacle with a shovel-like crest erect on one side. Branching bush often with a very short distinct trunk at very

base, 1 to 2 or even 4 inches diam. It must flower and fruit a long time as it is now still in full flower and with mature size fruits.

- Yucca whipplei.
- Cactus

No. 6736. Gilia capitata Sims ssp. abrotanifolia (Nutt. ex Greene) V. Grant with 6728

No. 6737. Leptosiphon aureus Nutt. 5-8 ft. h. with 6720, i.e. same hillslope.

No. 6738. Lupinus microcarpus Sims = L. densiflorus var. laetus var. laetus C.P. Sm. Open hillslope. Flowers white with pink-lavender tinge. = var. densiflorus Jepson.

Tehachapi Mts. 20 mi. W. of Rowen.

No. 6739. Cercocarpus betuloides Nutt. Stump sprouts. The newly grown bush, from an old stump on railway cut, looked very dark, so that at first I did not recognize it.

No. 6740. Gilia ~~achilleaefolia Bth.~~ capitata Sims ssp. abrotanifolia (Nutt. ex Greene) V. Grant. Open slopes. = ~~G. staminea~~ Greene.

No. 6741. Diplacus longiflorus Nutt. var. calycinus (Eastw.) Corolla large, pale yellow but a very definite color. Just beginning to bloom. Mimulus longiflorus (Nutt.) Grant. var. Calycinus (Eastw.) Grant. Det: A. I. G.

No. 6742. Plectritis Flowers very young pink; fruits Shady hillslope.

No. 6743. Sanicula bipinnata H. & A. Shady hillside.

No. 6744. Lathyrus vestitus ssp. bolanderi Wats. Corolla white; banner notched, veined in centre with blood-purple veins. Like Vacaville plant apparently. No. = Intergrade to L. laetiflorus Greene.

No. 6745. Balsamorrhiza deltoidea Nutt. Open steep northerly hillslope.

Tehachapi Mts.

– Above Beatville lies a dark heavy mountain with a few little drifts of snow near its northerly summit: It is Bear Mt. And there is a Bear Valley beyond it!

Apr. 14, 1916

– "Oh, Chief, it is glorious fun, this learning to be a botanist!" From one of my students in Tuolumne Co.

– In the dining room at Cahenti hangs a colored lithograph: Cypress Point" by Thos. Moran, N.A., which is very satisfactory. Done by the T.D.M. Co., Red Oak, Iowa. No. 155.

— walked thru very beautiful high country from Rowen to Cliff, a siding, and at a point of the hill about one mile, air line, from Bealville, I took a lateral ridge which ran down into the valley where 2 miles away an nearly lay Caliente. Cattle, unused to sight of persons on foot, stared at me as if they would attack, but I kept near a fence line which I had observed from above and so made my way to Caliente, the grass in the valley already drying up.

At the hotel when I went into supper a large sign on the dining room wall spoke out: "It is our Desire to please You" but my wandering eye caught its companion piece on the opposite wall: "If You think You can

please everybody start a Restaurant"! This cynicism struck my soul for the sign seemed to say: "You are very hard to please"; so my guilty eye withdrew for solace to the next wall "Please ask for more of anything you want" which cheered me up a bit and I ate my supper.

Caliente is an old-time stopping place on the way to Kernville and the mines on Kern River. An auto truck or so-called stage carries mail and passengers from Caliente to Kernville.

Caliente in its spring season looks less unattractive than ever I have seen it, for my memory is of hot summer or cold winter days. Today the hills are green, a cool breeze is stirring, and a group of Mexicans are chattering and laughing in a group, the only word which my ear can catch from them being "mañana".

— In the dry narrow valley at Colonia I collect some fairly large plants of Eschscholtzia californica. The flowers are exactly like the flowers at Vacaville* when they begin to grow smaller in May but are still golden yellow. The torus rim is fairly longer. I am thoroughly satisfied in my judgment that this and Vacaville plants are conspecific. This (No. is to be sure annual, at least is flowering from an annual-like root. There is no evidence that it is more than one year old, or rather one season old. But the Vacaville plant, while

* which I have studied and cultivated so much that I take them as a type.

undoubtedly perennial as it is commonly found, flowers the first year from the seed, for I have grown it in Berkeley in the Botanic Garden. And in dry years such first-flowering plants would, some of them, be killed out. The plants cultivated at Berkeley lasted only one season.

Such a vast horde of new species in Eschscholtzia have been published by the author of Pittonia and by Eedde and by a few others that it is going to be difficult to convince people of the truth of my position that eschscholtzia californica is a real aggregate not divisible and that there are but a few other species. On the validity of this proposition I am willing to stake

all my reputation for observation discernment and judgment. But still I have the unpopular end of the problem. My solution is not as attractive to some minds, not as reasonable to some others, not as credible even to some of fairly conservative disposition. They feel that where so many species are published that not all of them are valueless. In fact I believe an appreciation of this disposition of the human mind influenced the multiplication of species into a large number, so that the force of numbers would at least carry half of them. This is all the more to be supposed because there is no such thing as a standard of species. Each genus, particularly Each observer

genus sets its own standard. A fine intensive consideration of species has made a narrower standard (accepted by everybody) than that for Quercus for Carex or Lotus. There are some very fair botanists who dislike to accept the idea of wholesale reductions. They think it seems unfair and it does have that appearance because one can never go into the motives of multiplication, — in print. But if anyone has the free privilege of wholesale multiplication, another have the free privilege of wholesale I should reduction. One right implies the other. The author of Pittonia surely did not think all his new western Ptelea species would stand but he counted on a certain number. However he counted in vain with Percy Wilson in the North American Flora who neatly reduces them all!

Here in the dry granite

Caliente Ken Co. 1280 ft.

Sand at Caliente. It is natural to find the flowers of Eschscholtzia not so large as in the deep rich valley loam of Paca Valley where there is a high rainfall. Moreover it is natural that the plant here should tend to be an annual and not perennial.

No. 6746. Eschscholtzia californica Cham. var. crocea Jepson.

No. 6747. Baccharis
Looks like a Juniper. Two to three feet high, bushy, in low mounds or flat. Foliage branchlets much tufted. - Wet flat

No. 6748. not used.

No. 6749. Phacelia hispida Gray var. cicutaria Mohr.
Corolla very pale lavender-white. Appendages of stamens prolonged above point of insertion or rather union with filament, so that the "cup" is open and margined very little in front of stamen where joined to filament. Appendages with entire margin. Corolla 5 lines broad. Ovary hairy with straight erect hairs; lower part of style short-hairy. = P. distans Bth., acc. R. H. Hoover.

No. 6750 (Discarded, insect damaged) Malacothrix
Snake Head. Flowers dull white.

No. 6751. Rafinesquia Not flowering Discarded
Milky juice. A Chinaman is picking this for greens as he walks the railway track.

Caliente 1280 ft.

Kern Co.

No. 6752 Mirabilis Bigelovii Gray
Calyx red-purple but lighter in color than the San Diego plant (No. 6659.). Anthers yellow. Stigma purple. Calyx 8-10 lines broad. Very very sticky herbage. Rocky hills. Low, 8-12 in. high.

No. 6753. Astragalus didymocarpus H. & A.
Dry, open, sil.

No. 6754. Cryptantha flaccida Greene.
With 6753.

No. 6755. Not used.

No. 6756. Platystemon californicus Benth.
Flowers quite like Bay region plants. Moist flat.

No. 6757. Chaenactis
Abundant, open hillslopes.

No. 6758. Lupinus nanus Dougl. var. menkerae C. P. Sm.
Corolla blue; banner with white spot and dark blotches, this white spot few turning purple.

No. 6759. Baccharis viminea DC.
♀ Wet flat.

No. 6760. Baccharis viminea DC.
♂. Wet flat.

– Cont. from p. 150. This canon is really Tehachapi Pass with Cache Creek in the bottom of it.

Caliente 1280 ft.
Kern Co.

No. 6761. Oenothera dentata Cav.
Dry sandy soil in open. Corolla pure lemon yellow.

No. 6762. Lemna
Rivulet from freshwater spring.

No. 6763. Chorizanthe watsonii T.+G.
Banta way Plant
Dry ground, Bakersfield

No. 6764. =Eremalche Malvastrum exile Gray.
Bakersfield. Old field,

No. 6765. Eriogonum ~~angulosum~~ gracillimum
Bakersfield. Old half-cultivated field.

— Bakersfield: Due south or a little west of south are the snowy summits of San Emigdio. They get their true height value now. South is the low gap of the Tejon. Next eastward are 3 high and big independent summits which lie on guard by Tehachapi Pass and which we can see from Calico Mts. Thus there is a big summit lying in closer towards Bakersfield, just west and in full sight from Caliente and high above it, with a little snow and many pine trees.* Away to the north-east are snowy summits in extenso, the Greenhorn Range probably.

* See top of page 164.

No. 6766. Plagiobothrys arizonicus Greene.
Old dry field.

No. 6767. Trifolium gracilentum T. & G. var. in conspicuum Fer.
Old dry field

No. 6768. Festuca reflexa Buckl.
Grass in old field.

No. 6769. Atriplex torreyi
Two to 3½ feet h.

No. 6769. Malva
Old field

No 6770. Sonchus oleraceus
Old field

– Bakersfield is one of the San Joaquin valley towns which has grown out of my memory. It has blocks and blocks of business, and an extensive residence district of attractive well-to-do houses and equally attractive cottages. Chester Ave with its clock tower in the middle of the broad street, is a very attractive thoroughfare. A fine new and large courthouse of good classical design is a truly imposing structure on this avenue and is rendered truly pleasing by its beautifully laid-out grounds with fine rose bushes blooming profusely and Coprosmus shrubs in flower. Opposite it is the city hall, a structure worthy of the town as the courthouse

is of the county.

I notice various interesting things: the crowds on the streets as of a great city; autos with signs "Los Angeles to $4.50, round trip $6.00"; the excellent hotels; Greeks running good restaurants; parked streets, and not a few good gardens.

North of Bakersfield on Santa Fe line one or two miles is a wet slough country which will have fine fall botanizing.

South of Stoil a few miles we pass 2000 acres purple with Orthocarpus purpurascens, the soil uncultivated and doubtless a little alkaline. The wonderful display of this species in full bloom

continues north to Corcoran; here acres patches and more like a field of the cloth of purple! And north of Corcoran is a wonderful 100 acre field of it, relieved only by green figures on it, the green of low corn grass.

Running thru the Four Creek country is a great delight, — the Valley Oaks and the water! And immediately east are the magnificent Kaweahs high in the sky with many a snow-field and peak and rift — and the Sawtooth Range with them.

Brodiaea laxa colors the uncultivated lands south of Fairview; and there one sees all sort of beautiful pools of color in addition, on the plain. North of Stroud near Hanford

a field of Eschscholtzia californica has a pool of the poppy the deep red flame of Orthocarpus purpurascens.

Low spots in the grain fields delicate with the myriad jewels of Downingia flowers; splotches of Platystemon californicus; and a red I cannot guess. All this just south of Denair. About the Stanislaus River fields of poppies (Eschscholtzia) stretching on for miles away from the track – a truly great spectacle in the full afternoon sun – perhaps two thousand acres. And with all this wonderful flower show the Sierras rise grandly hundreds of miles of snowy slopes, domes and peaks.

Key to Downingia Species.

Folds on base lower lip and throat hardly any; yellow spots on folds of or tube summit of tube but no yellow on lip. D. tricolor, no. 6777.

Folds on lower lip and tube well-developed.
Folds not developed into nipples at the angle
Pair of spots on lower lip pointing to folds = greenish yellow; no purple dots .... D. ornatissima, no 6774.
Pair of spots on lower lip: yellow; and oriented by purple dots: D. pulchella, no. 6775.
Folds developed into nipples at the angle; transverse purple band at the angle covering the nipples
D. bicornuta, no. 6776

– Downingia bicornuta, no. 6776. Corolla blue; lower lip with white central field and 2 yellow spots, the margin of the field next to throat purple. Angle of lower lip and tube with 2 short prominent nipples opposite sinuses in lobes of lower lip, the lateral sides of the lateral lobes curved in such a way at the angle as to make two more pronounced not quite so large as the central ones but often very prominent. Upper lobes were better called violet – purple, they are just that.

See p. 186.

No. 6771. Brodiaea pulchella Jepson. = Dichelostemma pulchellum

Flowers lavender, flowering later than B. capitata. Stamens 3, deeply notched anthers top & bottom, opp. outer per. segments. Broad short lanceolate filx. off inner segs., each with a broad pointed scale on each side, somewhat longer than the anthers or rather exceeding the anthers.

No. 6772. Allocarya stipitata
Corolla large. Calyx-lobes 3 to 4 times length young achenes (3 or 4 flowers below anthesis flowers). Achenes striate ridged & back, carina only at top

No. 6773. Allocarya eusickii
Corolla small. Calyx-lobes only twice length young achenes (3 to 4 flowers below anthesis flowers). Achenes striate-ridged and carinate all way down back.

nos. 6772, 6773, 6774, at east end Little Oak ranch.

No. 6774. Downingia ornatissima Greene.
Corolla 5-6 lines broad, very light blue with white center and 2 yellow dots on the squarish white field, the yellow dots pointing to or ending in the 2 callous crests at angle of corolla limb at throat. Corolla-lobes trough shaped, and apiculate so as to give the impression of retuseness at apex. Upper (in general) lobes lanceolate, abruptly reflexed sidewise from the

middle, the sinus between projected backward so as to appear like a short horn. Similar processes or horns at sides where upper lip meets lower lip. Stamineal column incurved. Three purple blotches in throat opp. lobes of lower lip. Two solid acres of it on Little Oak Farm. One presses thousands of blossoms under foot in walking over it. Sinuses of corolla are cut below the horizontally spreading lower lip. Calyx-lobes ascending! The upper calyx lobes are really coiled downward on each side one coil with the tip ascending or pointing upward. Anther-column with 2 very short microscopic points at tip. See p. 188. See p. 199.

No. 6775. Downingia pulchella Torr. Corolla bright blue, quite flat on top, the slightly incurving stamineal column rising from the platform of the corolla. Upper lobes corolla oblanceolate, acute, divergently spreading, the angle between the lobes greater than the angle between these lobes and lower lip. Large white field on lower lip with 2 obovate yellow spots and 3 purple dots symmetrical on their lower part. Calyx-lobes rotate! Anthers with 2 bristles at apex, short but not microscopic — This is the common old-time species, most well-known to me, the most striking and beautiful of the four collected today. To be recognized dried by the long diverging upper lip lobes.

No. 6776. Downingia bicornuta Gray. Corolla 5 lines broad; lower lip like 6774 but with 2 ascending spurs at angle of the limb (really two slender "tits" or nipples. Anther-column with one slender forward-pointed bristle; column not rising out of throat (Column distinctly rising out of throat in 6774). Upper lip lobes very short, ovate, acute, curving straight backwards. Corolla sinuses cut below "platform" those between upper & lower lip run very far forward. The sinus between upper lobes has a little of the character as in 6774, indeed it is of the same order but not so marked in degree. One distinguishes this in the field

by its true violet-purple upper lip which marks it out. Both 6776 and 6775 grow with 6774, and 6776 may well be a hybrid between the other two. This may, doubtless, be recognized when dry by its very short & broad upper lip lobes. All the species have flowers which collapse or wrinkle in drying, being in fact delicate color jewels when alive, but all much alike when dried. Calyx-lobes rotate. See p. 183 for cont. Also p. 195.

No. 6777. Downingia concolor Greene. Corolla blue, upper lip with purple quadrate spot on white field in center. Lower lip 4 to 4½ lines broad, its lobes not trough shaped, but distinctly apiculate. Upper lip of 2 lanceolate parallel lobes, the space between them of subparallel lines. (6776 is V-shaped sinus to upper lip.) The lobes are turned backward about

Coll. n. of Cannon Sta.

horizontally. Stamen column with 2 short bristles to tip of anther mass. No processes at sinuses. The upper sinus simply a straight cleft. Anther-column included in tube. The distinctive thing in the appearance of this is the velvety purple spot in the center of the white field. Calyx-lobes ascending; no! rotate!

This species in form is very close to 6774 but is a smaller plant. The technical differences are slight but the color differences are marked. The corolla is a deeper blue and the position of the lobes of the upper lip very different. Recognized when dried doubtless by its general dark color and its central very dark spot.

No. 6778. Layia
Very abundant on the plains. The dwarfer plants have only 5 to 8 rays. I count on larger plants: 12, 12, 13.

No. 6779. Pogogyne zizyphoroides Bth.
Corolla blue, very minute. Upper lip small, erect, its apex notched very minutely. Lower lip larger, the central lobe largest, entire or retuse at apex. Stamens 4: 2 upper with sterile anthers; 2 lower with large fertile anthers. Calyx-lobes unequal, hairy or ciliate on margin and on inside.

Cannon Stā. Solano Co. 75 ft.

No. 6780. Lasthenia abundant in the hay and grain fields on the plains, often coloring considerable areas. — Little Oak Farm.

No. 6781. Orthocarpus purpurascens.

No. 6782. Ranunculus canus Benth. Petals 9 to 11.

No. 6783. Floerkea = Limnanthes rosea Hartw. Corolla white with dark brown or clear brown rings in the "eye", fading with a pink tinge.

No. 6784. Brodiaea hyacinthina Baker. Triteleia.

No. 6785. Pseudocamum carinatum var. solanense Jepson.

No. 6786. Juncus tenuis Willd.

No. 6787. Baeria

No. 6788. Delphinium variegatum.

No. 6789. Trifolium fucatum var. virescens Jepson. Alkaline pool Fd.

No. 6790.

No. 6791. Eschscholtzia californica. From Marked plants. Plant on north side railroad track at Vacaville along side Davis Farm south boundary. Begin just east of County road crossing into Davis Farm house and go east. Plants are marked with wire, its end attached to spikes driven into ground. Each spike has a separate mark and its wire always lies north and south. The location of each wired plant is directly south, in a due line, from a clew mark on the barb wire in the form of a piece of wire looped about the barb wire and with diverging ends.

In addition there were three plants marked on south side railway track. Begin at telegraph pole (marked on north side, with pencil, ≡ in two places, just 30 or 40 feet east of Davis east line fence. The plants are on railway bank near rails. One plant is exactly north of pole; the second six paces east of this; the third eleven paces still further east.

Key to Downingia species

Sinuses of corolla not cut below its platform.... D. pulchella, No. 6775

Sinuses of corolla cut below platform

Sinuses between upper & low lips cut straight down.... D. concolor, No. 6777

Sinuses between lips cut far forward, so that lower lip is "hinged"

Upper lobes not coiled; no processes at sinuses..... D. bicornuta No. 6776

Upper lobes coiled; horn-like processes at sinuses.... D. ornatissima, No. 6771

Vacaville (n. of, near Violet sta.)

No. 6792. Allocarya stipitata Greene. Large-flowered. This forms extensive white sheets in a flat near Violet Station just north of Vacaville. It is the species which in an earlier day, before this country was plowed, made "white lakes" and "white streams" when pools and shallow streams on these plains were sharply defined; The water stood during the winter, going off later, left these mud beds which furnished conditions of growth suitable for the uniform development of one species, especially if it got the start of others. Another species, No. 6794 made even more striking "gold lakes" and "gold streams" the borders sharply defined by the general vegetation of grass.

No. 6793. Allocarya Small-flowered. This seems to occur always wherever 6792 grows. Both are mud-flat or adobe-flat species.

No. 6794. Baeria The common inhabitant of beds of vernal pools and low places, forming uniform sheets of color. See 6792.

No. 6795. Delphinium

Flowers pale lavender, pinkish, whitish, bluish, — all in one spot- 20 ft. sq.

Dichelostemma pulchellum B. pulchella Greene

No. 6796. Brodiaea congesta Sm. appendages longer than anthers. Deep-seated bulbs, often down one foot. Stamens with anthers 3, opp. inner per. segments; anthers deeply notched base and apex. alternate stamens represented by a broad short-acute (dancolate) small scale or filament, bordered each side by a large broad acute appendage.

No. 6797. ~~Gilia~~ leucocephala (Bth.) Dried pool beds, one of the commonest inhabitants (on the gravelly clay plains and adobe plains) of the vernal pool beds. = Navarretia leucocephala Bth.

No. 6798. Downingia "Calico Downingia". Vernal pool beds.

No. 6799. Same as 6794

No. 6800. Same as 6794

No. 6801 Same as 6794

The first day (Apr. 20) of my botanizing at Vacaville I walked southeast to the Little Oak Farm, cut across fields to the Overland Railway track near Roberts Ranch, then south to Cannon Stn., then through the swale of the hills back to the east end of Little Oak Farm and to Vacaville. It was a fine clear cool day with the Sierras lying in the far haze eastward. On Little Oak Farm I passed from grainfields to drowned spots all asheen with the delicate lavender tint of Downingia ornatissima (No. 6794). In walking across ten acres of it, well-nigh pure and the blossoms almost touching each to each, I pressed thousands of blossoms under foot. These flowers are like delicate jewels — so rare, so finely cut, so exquisite. It was a surprise

Vacaville, Apr. 22, 1916.

to find four (spaced) of them; to find them mixed but each are "pure" in other places except 6776. No 6777 (Dunnigia concolor) seems to be further east. I did not see it on the Little Oak Farm. cf. Kay p. 195.

No. 6775 (D. pulchella) is a glorious color maker and forms enchanting spots where one finds it in the fields. ¶ The most common flowering species on the plains are, in order: 1. Layia No. 6778; 2. Lasthenia No. 6780; Baeria No. 6787.

I walked today aglow with the sky, the air, the great plains, the mountains looming on their border. I walked with pleasure, with delight, with exaltation!*

*[with some reason. It was my first day back from convalescence. Two years more of up-hill - but always gaining. — Mar. 3, 1933.]

San Diego Addresses.

— Miss Laura McDermott, San D. High School.

— Miss Gertrude Allen, San D. High S.

Barstow Addresses.

- Hippolyte Jaloroan, miner
- Uncle Ben Harris, Coolgardie
- Aloysius Alvay, Waterman Ranch
- J. Herbert Manson, " "
- Jennie Wi Cook (Mrs. Davis).
- ~~Dix~~ Van Dyke. Mary Van Dyke Daggett.
- Mary Beal. Daggett.
- Johnday, Barstow, the man who took Parish & Huntington to Death Valley.
- Ben Harris & Ben Harris Jr. Coolgardie.

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